Conflict and Health

REVIEW

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Menstrual hygiene management among girls and women refugees in Africa: a scoping review

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Abstract

Background Menstrual Hygiene Management (MHM) presents a significant public health challenge for refugee women and girls in Africa. Displaced populations often lack access to menstrual products, adequate Water, Sanitation, and Hygiene (WASH) infrastructure, as well as comprehensive menstrual health education.

Aim This scoping review aimed to understand the state of MHM, identify key challenges, and evaluate existing interventions among refugee women and girls in Africa.

Methods Employing Levac et al.'s framework, the review analysed evidence from databases like CINAHL, Emcare, PubMed, Scopus, and Web of Science, focusing on studies published between 2014 and 2024. Sixteen articles met the inclusion criteria, and both numerical summaries and descriptive analyses were conducted.

Results Refugee women and girls often lack access to both disposable and reusable menstrual products, resorting to unhygienic alternatives such as clothing, leaves, and paper. Inadequate WASH facilities restrict safe and private spaces for menstrual management. Cultural stigma and taboos surrounding menstruation contribute to social exclusion and school absenteeism among girls. The interventions included distributing dignity kits, enhancing WASH infrastructure, and providing menstrual health education; however, they were inconsistently implemented due to resource limitations and cultural obstacles.

Conclusion This study highlights the urgent need for sustainable menstrual health solutions in refugee settings. Without access to necessary products, WASH facilities, and stigma-free education, women and girls risk exclusion, health issues, and interrupted education. Addressing these barriers requires consistent, well-resourced interventions that integrate cultural sensitivity to ensure dignity and long-term impact.

Keywords Menstrual health, Menstrual hygiene, Menstrual products, Girls, Women, Refugees, Africa

Background

Menstrual health is increasingly recognised as essential to gender equality and human rights [1]. Access to menstrual hygiene products, education on reproductive health, and suitable sanitation facilities form the core of Menstrual Health and Hygiene Management (MHHM), which is integral to women's overall health and well-being—an essential focus of Sustainable Development Goal (SDG) 3 [2, 3]. The term "Menstrual Health and Hygiene (MHH)" is used to describe the needs

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experienced by the people who menstruate, including having safe and easy access to information, supplies, and infrastructure needed to manage their periods with dignity and comfort [3].

Menstrual Hygiene Management (MHM) refers to the practice of women and adolescent girls using clean materials to absorb menstrual blood, which can be changed privately as often as needed throughout their menstrual period. It also includes access to soap and water for personal hygiene, the washing of reusable materials when required, and facilities for properly disposing of used items [4, 5]. According to Budhathoki et al. [4], "menstrual hygiene management (MHM) is an essential aspect of hygiene for women and adolescent girls between menarche and menopause". MHM among refugee and migrant women is a critical yet often overlooked issue in humanitarian contexts [4, 6].

Addressing MHM in humanitarian settings requires a multisectoral approach, including education, improved facilities, and culturally appropriate interventions [7]. Innovative approaches to address these issues include designing female-friendly Water, Sanitation, and Hygiene (WASH) facilities, improving waste management, and engaging beneficiaries in the design process [8]. These interventions can reduce the stigma around menstruation through education and awareness campaigns [9, 10]. Strategies like workshops and pamphlets are essential for explaining menstruation and providing practical hygiene advice [11]. To improve menstrual health, policies should incorporate it into broader health and education efforts and address social issues like poverty and gender inequality [12].

Displaced and refugee women face numerous challenges, including insufficient access to safe and private facilities, limited resources, and alterations in menstrual practices [8, 13–15]. Furthermore, stigma surrounds menstruation, causing fear and social isolation, especially in public areas of humanitarian settings [16, 17]. Many women lack access to sanitary products, soap, and clean water, making it difficult to manage their menstruation effectively [18]. In refugee camps, poor sanitation facilities can lead to harassment and gender-based violence [19, 20]. Additionally, the lack of proper disposal options increases feelings of embarrassment and health risks [8, 16, 21–23]. Many girls miss school due to menstrual pain, insufficient supplies, and fear of leaks [24, 25]. Cultural restrictions further limit their ability to participate in daily activities [18]. Studies have shown that refugee girls and women experience unpreparedness for menarche, limitations in cultural, physical, religious and social activities, and school absenteeism due to poor MHM [20, 21, 24]. Furthermore, there is a lack of accurate information about sexual and reproductive health, which leads to misconceptions about menstruation [26, 27]. Studies highlight the urgent need for thorough research on effective MHM practices and involving the communities affected by these issues to develop appropriate and lasting solutions [28, 29]. Furthermore, Improving menstrual health and hygiene management for women refugees and migrants is essential to protect their well-being and dignity [7, 11, 30]. Enhancing collaboration across different sectors to tackle the various menstrual health and hygiene challenges is essential [11, 19].

Drawing from background and contextual insights of issues around menstrual hygiene, this study aims to understand the state of MHM, identify key challenges, and evaluate existing interventions for refugee women and girls in Africa.

Methods

This study used the scoping review framework from Levac et al. [31] to map the evidence about MHM in Africa. This framework outlined the systematic approach used to map the existing literature and included the following steps: identifying the research questions, identifying relevant studies, study selection, charting the data, collating, summarising and reporting the results.

Identifying the research question

The first step in the scoping study methodology is to formulate the research question, which provides the foundation for the entire review by setting its direction and scope [31]. While scoping reviews typically begin with broad research questions to encompass a wide range of evidence, researchers should aim for clarity by defining key elements such as the central concept, target population, and specific outcomes of interest [31]. Arksey and O'Malley [32] highlighted the need for broad questions and recommended clearly defining the scope of inquiry early on, linking the research question to a well-defined study purpose to organise the selection of relevant studies and identify potential outcomes.

In this study, developing research questions involved several important steps for clarity and relevance. Researchers identified a knowledge gap and issues which required exploration, followed by a literature review to understand existing studies. This was followed by defining the study's aim, deciding on the questions needed, and ensuring they aligned with the research methods. Researchers discussed the questions with peers and experts to make sure they were clear and specific. The following research questions were used to map the studies about the current state of MHM among women refugees in Africa:

1. What is the current state of MHM knowledge and practices among women refugees and migrants in Africa?
2. What are the challenges faced by women refugees and migrants in accessing MHM resources and services in Africa?
3. What are the effective interventions and strategies for improving MHM among women refugees and migrants in Africa?

Identifying relevant studies

The second step of the scoping study methodology focused on identifying relevant studies to ensure a comprehensive review [31]. A comprehensive search strategy was developed to identify peer-reviewed articles and grey literature, as recommended by Levac et al. [31]. In this study, databases included CINAHL, Emcare, PubMed, Scopus, and Web of Science. Each database specialises in different fields, ensuring we captured a wide range of studies, especially those focused on healthcare practices for refugee women and girls. CINAHL and Emcare emphasised nursing and health research, while PubMed provided biomedical studies on menstrual hygiene management. Scopus and Web of Science added insights from social sciences and high-quality peer-reviewed research. This comprehensive approach ensured we didn't overlook important information, leading to more reliable findings on menstrual hygiene challenges faced by refugee women and girls in Africa. Additionally, a hand search strategy was conducted on Google and Google Scholar to find resources that might have been missed during electronic database searches.

Databases were searched using keywords: menstruation, menstrual health, menstrual hygiene, hygiene management, refugees, girls, women, and Africa. Search terms were adapted for each database to ensure a broad coverage of relevant literature. To refine the search results and improve the accuracy, the following approaches were used: Boolean operators (AND, OR, NOT) were used to narrow search results, Parenthesis () to group words and retrieve the results related to each other, Quotation marks ("") to retrieve results with exact phrases rather than individual words, wildcards and Truncation by using Asterisk (*) and question mark (?) to represent multiple character variations of a word. The following is an example of the keyword combinations:

- *S1*: (Menstruat* OR "Menstrual Health" OR "Menstrual Hygiene" OR "Menstrual Management")
- *S2*: exp Refugee/
- *S3*: Girl* OR Wom?n
- *S4*: exp Africa/
- *S5*: S1 AND S2 AND S3 AND S4

A timeframe of 10 years was considered from 2014 to 2024 to ensure the balance between comprehensiveness and relevance. Furthermore, a 10-year limit ensured the inclusion of studies reflecting the latest MHM policy shifts, advancements, interventions and challenges.

Selecting relevant studies

Step three entailed selecting relevant studies using inclusion and exclusion criteria, as Levac et al. [31] recommended. The included studies were peer-reviewed articles or grey literature, including dissertations and reports on menstrual health and hygiene management among African girls and women refugees. Those studies were published in English. Exclusion criteria included non-empirical studies that were not specific to the target population or region and those that did not address MHM. Furthermore, the research questions and Mixed Methods Appraisal Tool (MMAT) guided the selection of the relevant studies. EndNote Version 20 was used to manage the retrieved sources.

After the quality appraisal, a PRISMA flow diagram was used to display the final number (Fig. 1). The process of identifying relevant studies was systematically divided into three main phases: identification, screening, and inclusion. In the identification phase, a total of 3127 records were retrieved through database searches, supplemented by an additional 27 records identified through manual searches (Google and Google Scholar). Following the removal of duplicates, 2867 records remained for screening. During the screening phase, all 2867 records were assessed, resulting in the exclusion of 2833 records based on predetermined relevance and eligibility criteria. Consequently, 34 full-text records were reviewed for eligibility; however, 18 were excluded for reasons being non-empirical (n = 10) and not relevant (n = 8). In the final inclusion phase, 16 studies were selected for data extraction and descriptive analysis. Selected studies included six qualitative, two quantitative, and eight mixed-methods studies.

Charting the data

Step four of the scoping study methodology focuses on data charting, where researchers extract and organise key information from selected studies [31]. The goal is to develop a structured overview of the existing literature, which aids in effectively summarising and comparing studies [31]. Rather than simply summarising the studies, this step emphasises organising data to support meaningful analysis and synthesis in later stages. Levac et al. [31] emphasise that charting should be an iterative process, allowing researchers to refine the charting form based on

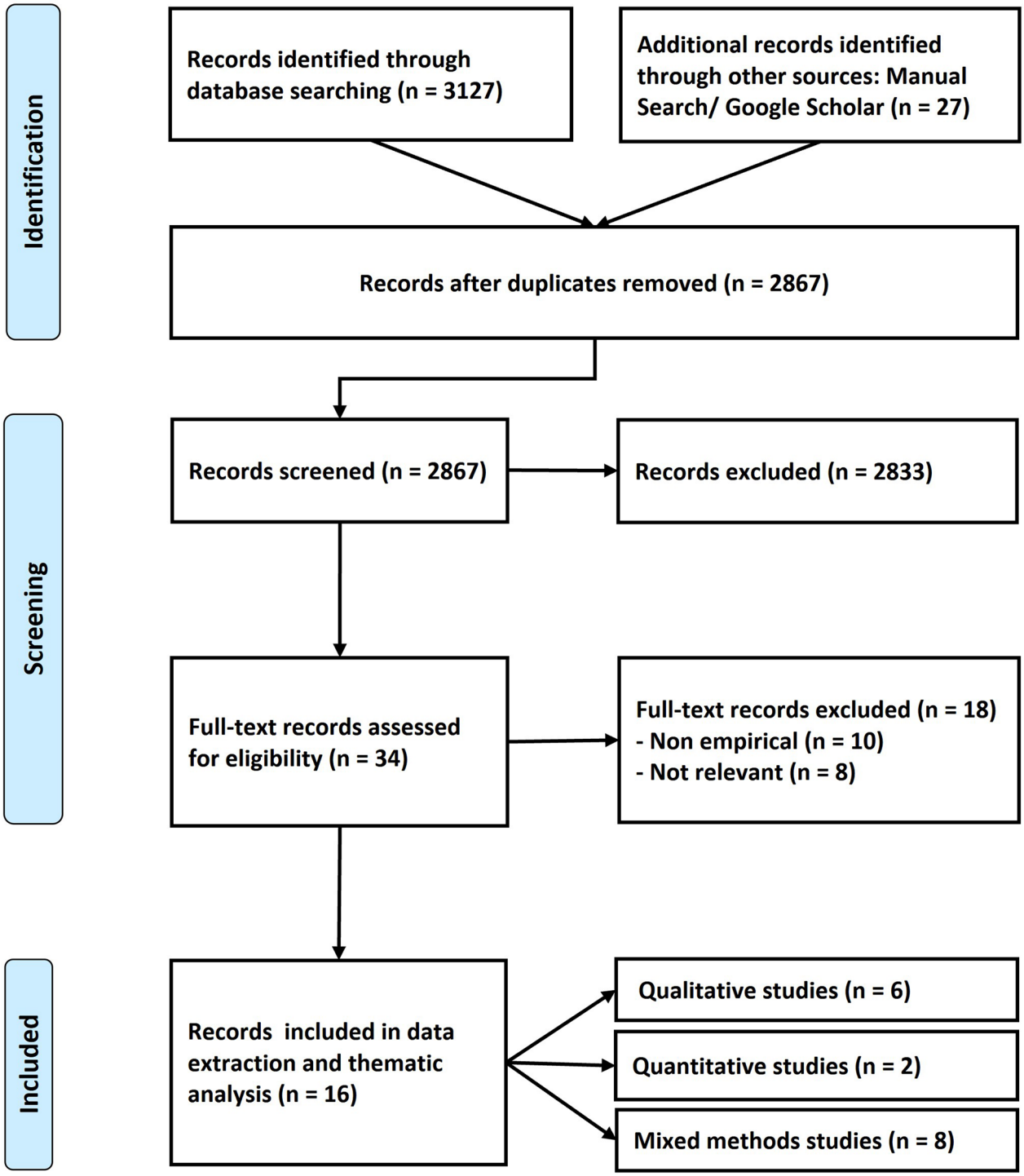

Fig. 1 PRISMA flow diagram

data extraction and the research question. In this study, the data-charting form included the following relevant variables: Authors, year, location of the study, aim, population, study design, intervention, findings and intervention effects if applicable (Table 1).

Collating, summarising and reporting the results

Step five of the scoping study methodology involved collating, summarising, and reporting the results, as recommended by Levac et al. [31]. This phase assisted in organising and analysing the collected data. Numerical

Table 1 Summary of the study findings

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Beeman et al. [16]	Uganda	"Assess the desirability, acceptability, and feasibility of the Mini as an intervention to support safer, more dignified MH practices"	People who menstruate Health and humanitarian members Community members without access to Cocoon mini structures Cocoon mini supervisors	Mixed methods	A total of 20 Cocoon Minis were constructed in the Bidi Bidi refugee settlement The Minis provided access to a private latrine, bathing facility, water source, disposal options, and other features to support menstrual health management	The Cocoon Mini, a safe and private space for managing menstruation, was widely accepted and desirable among people who menstruate and the broader community The Cocoon Mini improved menstrual health management by providing key features like waste bins, lighting, and water access The Cocoon Mini increased the sense of physical and psychological safety for people who menstruate	95% of people who menstruate said the Cocoon Mini made menstrual health management easier 96% cited improved water access as a key feature that made menstrual health easier to manage 47% cited the disposal system as a key feature 94% of people who menstruate expressed approval of the Cocoon Mini space
Calderón-Villarreal et al. [19]	Bangladesh, Kenya, Uganda, South Sudan, and Zimbabwe	"To quantitatively analyse WASH access among refugee camps—To focus on WASH access in households with women of reproductive age"	Women refugees	Quantitative	N/A	Large inequalities in WASH access were found across refugee sites High access to improved water (95%) but lower access to basic sanitation (30%) The Female WASH Access Index identified that Zimbabwe had the lowest Female WASH Access Index Score Households with members with disabilities or who are elderly had lower WASH access compared to other households	N/A

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Crankshaw et al. [27]	South Africa	"Explore the reproductive health and rights needs and challenges amongst young refugee women in South Africa"	Young women refugees	Qualitative	N/A	Participants had poor reproductive health knowledge due to lack of access to comprehensive sexuality education Positive experience of learning about menstruation Learning from school and family members about menstruation, hygiene practices, and how to take care of oneself Some participants had access to contraceptive and Termination of Pregnancy (TOP) services	N/A

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Ene et al. [18]	Nigeria	"To assess the knowledge, attitude and practices of menstrual hygiene management among adolescent girls and young women in the Durumi IDP camp, Abuja, Nigeria"	Adolescent girls and young women refugees	Quantitative	N/A	The majority of the respondents had good knowledge and a positive attitude towards menstruation and menstrual hygiene management, despite residing in an IDP camp 90.7% had heard abunt menstrtuation and menstrual hugiene before menarche. 92.8% knew poor menstrual hugiene can reults in infection Most respondents practiced good menstrual hygiene, such as using sanitary pads (69%), changing absorbents at least twice a day (90%), and washing hands before and after changing absorbents (91.8%)	N/A

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
IFRRCS [33]	Uganda, Somaliland, Madagascar	"Improve the dignity of women and adolescent girls during emergency situations and to provide further evidence for MHM Kits as global relief items"	Girls and women refugees	Mixed methods	MHM Kit A: Disposable sanitary pads for 1 month MHM Kit B: Reusable sanitary pads for up to 12 months with monthly distribution of consumables like soap MHM Kit C: Combination of reusable/washable pads along with disposable pads	The MHM kits and information sessions significantly improved beneficiaries' knowledge about menstruation across the three countries The MHM kits led to significant improvements in dignity, with over 50% of respondents reporting reduced feelings of embarrassment during menstruation There was a marked increase in the proportion of respondents, especially adolescent girls, who could correctly identify the normal duration of a menstrual period	Significant increases in knowledge about the normal length of menstruation, from 78 to 88% in Madagascar and 84% to 94% in Uganda 19% reduction in reported cases of itching or irritation in Somaliland Reduction in reported restrictions in daily life during menstruation from 78 to 6% in Somaliland Overall, infections and itching during menstrual flow reduced by 10%; preference for washable pads decreased from 87 to 57%, while preference for disposable pads increased from 8 to 40%
Ivanova et al. [26]	Uganda	"Assess sexual and reproductive health (SRH) experiences and knowledge of refugee girls in the Nakivale settlement"	Adolescent girls refugees	Mixed methods	N/A	A total of 43% of the menstruating girls missed school during their menstruation due to multiple reasons The girls were also afraid of staining (22%) and some had no product to manage menstruation (16%) Minority of them (2.8%) were afraid of being teased and the same proportion were also prevented from attending schools because of religious barriers or social taboos related to menstruation	N/A

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Kemigisha et al. [24]	Uganda	"Describe the menstruation practices and experiences of adolescent girls living in the Nakivale refugee settlement in Southwest Uganda"	Adolescent girls refugees	Qualitative	N/A	The girls had unfavourable menstruation experiences included being unprepared for menarche, lack of knowledge, limitations in activity and leisure, pain, school absenteeism, and psychosocial effects (shock, fear, shame and embarraseement) The girls' menstrual practices included the use of unsuitable alternatives for menstrual hygiene management and poor health-seeking behaviour 5–6 packets of disposable pads per woman for an average of six months (provided by UNHCR)	N/A

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Kuncio [36]	Uganda	"Test the appropriateness and acceptability of AFRIpads reusable sanitary pads in southwestern (Ugandan) refugee context among schoolgirls"	Schoolgirls refugees (including Ugandan nationals)	Mixed methods	Distribution of AFRIpads Menstrual Kit (4 reusable sanitary pads, underwear, soap, and bucket) for three months Menstrual hygiene training and instructions on the use and care of AFRIpads for three months	Schoolgirls in the refugee settlements lacked access to necessary menstrual hygiene products and knowledge prior to the intervention 20% of the surveyed girls admitted to reusing disposable menstrual pads at the basseline The intervention with AFRIpads helped address the lack of menstrual products that the girls were facing The girls were highly satisfied with the AFRIpads and widely adopted their use	Uptake of AFRIpads: 99% tried, 92% used during last period School absenteeism: Reduced by half Leaks: Reduced from 59 to 9% Itching/Burning: Reduced from 73 to 24% Satisfaction with menstrual products: Increased from 39.6% to 86.1% Preference for reusable pads: Increased from 52 to 84% Access to water: Increased to 73% always having enough- Not having enough products: No longer a top challenge post-intervention

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Nielsen [20]	Tanzania	"Assess the appropriateness and level of Menstrual Health Management (MHM) for women and girls in the Nyarugusu refugee camp in order to inform the design of future interventions by humanitarian actors"	Girls and women refugees	Qualitative	N/A	Inadequate MHM interventions or sufficient to meet the needs of women and girls Significant lack of essential resources such as underwear, water, soap, buckets, privacy, and sanitary materials necessary for maintaining proper hygiene during menstruation The lack of adequate MHM support Disconnect between the expressed needs of women and girls and the support provided by the interventions Humanitarian organisations struggled with implementing effective MHM interventions due to a lack of experience, understanding, and knowledge	N/A

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Norelius [28]	Uganda	"Investigate how the study population access information about menstruation and assess girls and women's access to and usage of sanitation facilities and materials as well as access to MHM influence the lives of girls and women in Rhino refugee settlement"	Girls and women refugees	Mixed-methods	N/A	37.1% used disposal pads, while 31.4% used old rags for MHM Fear and shame limit access to information Poverty was a major factor preventing girls and women from accessing the menstrual products Lack of access to information, menstrual products, and soap caused significant stress and challenges for girls and women in the refugee settlement Some girls reported missing school during their periods, mainly due to lack of menstrual products Organisational support in MHM is inconsistent	N/A

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Sanduvac et al. [25]	Tanzania	"Conduct a thorough assessment of Plan International Tanzania's MHM program for adolescent girls, to identify gaps and to advise on which additional subjects girls need in school"	Adolescent girls refugees	Mixed methods	Distribution of dignity kits (including AfriPads, soap, panties, body lotion, and wrap cloth) to adolescent refugee girls, with AfriPads usable for 12 + months Provision of Menstrual Hygiene Management (MHM) training to the girls at Hope Secondary School Improvements to WASH (Water, Sanitation and Hygiene) facilities at Hope Secondary School	Lack of gender friendly-latrines No reliable coping mechanism during menstruation, Lack of menstrual hygiene management (MHM) severely impacts the daily school life and attendance of adolescent girls Providing dignity kits and MHM training directly improves girls' school attendance Adolescent girls lack reliable support from families, teachers, and the community during their menstruation, which jeopardises their education	MHM kits and training positively impacted on menstrual health, school attendance, readiness to menstruation, and confidence to handle menstruation

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Schmitt et al. [21]	Nigeria	"Fill an identified gap in the MHM response literature and guidance around menstrual disposal and laundering of reusable menstrual materials"	Girls and women refugees Humanitarian response staff	Qualitative	N/A	Poor access to menstrual materials and supplies Insufficient menstrual protection for those using cloth Challenges for using reusable pads due to lack of underwear, and items required for the routine cleaning them Insufficient access to MHM-supportive toilets, including discret places for laundering, lack of disposal options and poor lighting Inconsistent distribution of disposable and reusable menstrual pads by NGOs to adolescent girls and women aged 15–49 years	N/A

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Sibanda et al. [34]	Zimbabwe	"Examine the appropriation of African Indigenous Knowledge Systems (AIKS) in the implementation of WASH activities by women at Tongogara Refugee Camp (TRC), Zimbabwe"	Women and males refugees	Qualitative	N/A	Women refugees recognises their roles in managing WASH activities in the camp using their AIKS Menstruation is a significant challenge for adolescent girls in the camp, with cultural taboos and restrictions making their lives difficult, leading them to rely on traditional AIKS for managing menstrual health Disposal of menstrual materials in pit latrines and waste bins by fearing that they could be retrived for witchcraft purposes	N/A
Sommer et al. [29]	Tanzania	"To systematically monitor and describe the implementation of the MHM in Emergencies Toolkit in an ongoing humanitarian emergency, to capture in real-time the lessons learned from the perspectives of practitioners addressing MHM, to refine the MHM in Emergencies Toolkit"	Adolescent girls and women refugees	A mixed-methods	Introduction and pilot testing of the "Menstrual Hygiene Management in Emergencies Toolkit" in three refugee camps in Northwest Tanzania Training and capacity building activities to support the implementation of the toolkit across multiple organisations and sectors working in the refugee camps	Content gaps in the MHM toolkit Multi-level trainings and leadership support were essential for the successful implementation of the MHM response The study highlighted the importance of cross-sectoral collaboration, including non-WASH actors, in supporting menstrual hygiene management	The toolkit provided guidance on a comprehensive MHM response including menstrual materials and supplies, MHM supportive facilities, and MHM information Training was found to be essential to the success of the MHM

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Uwimana [17]	Rwanda	"To document knowledge, support and facilities given to menstruating girls and women in Kigeme Refugee Camp to highlight gaps and provide recommendations"	Girls and women refugees Humanitarian organisations	Qualitative	N/A	Girls attending school tend to have more biological knowledge, while women have practical experience in managing menstruation Insufficient menstrual materials, lack of privacy, and inadequate WASH (Water, Sanitation, and Hygiene) facilities Challenges for the disposal of the saniatry pads The taboo nature of menstruation often prevents girls and women from voicing their needs	N/A

Table 1 (continued)

Author and year	Country	Aim	Population	Study design	Intervention	Findings	Intervention effects
Wynne [11]	Burundi and Uganda	"To conduct a comparative narrative analysis to evaluate learnings from four piloted MHM projects against the Toolkit guidance To identify and explore synergies and gaps, or suggestions for improvement to future toolkits."	Girls and women refugees Support staff Peers (boys and men)	Mixed methods	Distribution of reusable pads and menstrual cups, along with training on menstruation and MHM material use to girls in primary schools, their mothers/guardians, and other community members in Rhino Distribution of disposable and reusable/washable menstrual hygiene kits, along with instructions on their use and safe MHM practices in Bwagiriza Distribution of hygiene kits containing reusable sanitary pads, along with training on their use to primary and secondary schoolgirls in Kyaka II, Rwamwanja, Nakivale	Distributed reusable pads were perceieved easier to use in limited privacy Improper disposal of pads had an environmental impacts such as polluted water sources, and blocked latrines Single use pads were not viewed as sustainable solutions 68% of adolecents and 65% of women were satisfied or very satisfied with the disposable kits Current focus should shift from distribution of menstrual materials to developing scalable long-term strategies Retention of MHM knowledge after the training was reported to be a challenge	Basic MHM knowledge: Increased from 15 to 65% Experiencing leaks and stains: Decreased from 59 to 9% Satisfaction with reusable pads: 90% of adolescent girls and 85% of women satisfied or very satisfied in Bwagiriza camp Satisfaction with menstrual cups (81%) and 52% preferred menstrual cups over reusable pads Knowledge of average length of menstruation: Increased from 25 to 78% Difficulties understanding hygiene items: Less than 10% reported difficulties 23% reported still lacking sufficient MHM information post-training:

summaries and descriptive analyses highlighted the scope of the literature. Quantitative metrics detailed the characteristics of the studies, while descriptive analysis identified key patterns and relationships within themes. The findings were systematically presented in accordance with the objectives of the scoping review.

The extracted data were synthesised to provide an overview of the current state of MHM among women refugees in Africa. The synthesis was narrative, summarising the key themes and findings from the literature. The findings were reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines to ensure transparency and completeness.

Ethical considerations

Ethical approval was not required since this is a scoping review of published literature. However, the review adhered to PRISMA-ScR guidelines for conducting research and reporting findings.

Findings

Study characteristics

The scoping review analysed 16 studies with various research designs for data collection and analysis. Six (37.5%) of these studies used a qualitative research design and relied on interviews, focus groups, and observational methods for comprehensive insights. On the other hand, 2 out of the 16 studies (12.5%) used a quantitative research design, focusing on statistical and numerical data for conclusions. Eight of the 16 studies used a mixed methods approach, applying statistical analyses and qualitative insights for a more comprehensive perspective. Furthermore, six of the 16 studies focused on the interventions to improve the MHM.

Regarding the location where the studies were conducted, the majority of the studies were conducted in Uganda (n = 5), followed by Tanzania (n = 3), Nigeria (n = 2). South Africa, Rwanda, and Zimbabwe have one study each. Three studies were conducted in multiple countries: Burundi and Uganda; Somalia, Madagascar and Uganda; and Kenya, Uganda, South Soudan, Zimbabwe and Bangladesh.

The reviewed research studies primarily focused on the study population of girls and women of reproductive age residing in refugee or humanitarian environments. These studies centred on the distinct challenges encountered by this demographic, particularly regarding their menstrual health and hygiene. Alongside this primary group, a few studies incorporated key informants, including representatives from both male and female humanitarian organisations and community members. These supplementary perspectives aided in developing a more comprehensive understanding of the support systems, obstacles, and social dynamics surrounding the study population.

MHM knowledge and practices among girls and women refugees

Across 16 studies included in this review, knowledge and practices about menstrual hygiene were discussed. Although those studies found that girls and women had a certain level of knowledge in managing menstrual hygiene, in four studies [11, 21, 24, 25], there was a consistent emphasis on the lack of adequate menstrual education, which leaves women and girls without the necessary knowledge or tools to manage their menstruation safely and hygienically. This educational gap often resulted in adverse health outcomes, social stigma, and challenges in education. A study by Sanduvac et al. [25] in Tanzania revealed that adolescent girls often lacked basic menstrual knowledge before menarche, leading to feelings of unpreparedness and shame. These girls frequently resorted to unhygienic materials, increasing their risk of infections and contributing to social isolation due to stigma and exclusion from school activities.

Similarly, Schmitt et al. [21] reported that women in displaced communities in Nigeria faced confusion about managing menstrual health. Additionally, Schmitt et al. [21] highlighted the ineffective use of reusable menstrual products distributed by non-governmental organisations (NGOs) due to insufficient training, underscoring the need for comprehensive educational programs. In Uganda, Kemigisha et al. [24] found that inadequate information led to widespread misconceptions about menstruation, often perceived as a disease or curse. This misinformation fostered poor hygiene practices and emphasised the necessity of integrating menstrual health education into school curricula to provide accurate, age-appropriate information [24]. Wynne [11] found that limited access to health information led to unsanitary practices, and a successful educational intervention by healthcare workers and NGOs significantly improved menstrual health knowledge and practices among participants.

Girls and women in refugee settings used menstrual products, including disposable Pads, reusable pads, improvised materials and makeshift Pads [21, 25, 28, 33]. Disposable pads were widely favoured for their convenience and effectiveness; however, they were not consistently accessible in refugee settings. Schmitt et al. [21] highlighted that while NGOs may distribute these pads during emergencies, their regular availability was not assured, and many could not afford them consistently. The ability to discard them after use is particularly advantageous when washing facilities are

inadequate. Schmitt et al. [21] noted that many women in Nigeria continue to prefer disposable pads due to cultural norms and the stigma surrounding menstrual blood.

In humanitarian settings, reusable pads have gained traction due to their sustainability. These washable pads can last for months or even years and are frequently included in dignity kits provided by NGOs [21, 33]. Specific humanitarian organisations have introduced Afripads, reusable sanitary pads designed explicitly for low-resource environments. Sanduvac et al. [25] noted that Afripads are distributed in some camps as part of dignity kits, providing a durable option that can be washed and reused for several months. However, like other reusable products, they require access to clean water for proper maintenance. A study by the International Federation of Red Cross and Red Crescent Societies (IFRRCS) [33] found that although female refugees used reusable and washable pads, WASH facilities were necessary. Some respondents, particularly adolescent girls, expressed embarrassment about disposing of the blood-contaminated water from washing menstrual pads [33].

Similarly, Schmitt et al. [21] pointed out the challenges of maintaining these pads, as they require regular washing and drying, which can be difficult in areas with limited water and privacy, potentially leading to hygiene issues. In a study by IFRRCS [33], girls and women reported that stagnant bloodied water emitted an unpleasant odour. One study [28] reported the use of tampons and menstrual cups. However, these products were less commonly used in refugee settings due to cultural taboos and cost barriers. Furthermore, Norelius [28] identified that NGOs rarely distributed tampons due to cultural resistance in communities where internal menstrual products were not widely accepted. Similarly, while sustainable, menstrual cups necessitate education for proper use, which is often unavailable [28].

In extreme circumstances, girls and women refugees used improvised materials such as leaves, paper, old cloth, or even plastic bags when other products were unavailable [21, 25]. Sanduvac et al. [25] reported that female students relied on old clothes due to the lack of suitable menstrual products. These materials were often unhygienic and uncomfortable, increasing the risk of infections and leaks [25]. Schmitt et al. [21] added that, although some used cloth before displacement, adequate discreet cleaning and drying facilities are often lacking in crisis settings. Furthermore, Schmitt et al. [21] noted that in some camps, girls have resorted to using plastic bags or other unsuitable materials, which can cause irritation and infection. The selection of menstrual products in these contexts is influenced mainly by their availability, cultural norms, and the level of education regarding menstrual health [18, 20, 25].

Hindrances to MHM

In this study, the challenges to menstrual hygiene management included inadequate WASH facilities, lack of access to suitable menstrual products, and cultural and social stigma.

Inadequate WASH facilities

Ten studies discussed issues around WASH facilities to facilitate MHM [16–18, 20, 21, 24, 25, 29, 34, 35]. Insufficient WASH facilities posed a major barrier to effective MHM, particularly in resource-poor settings and among displaced and refugee populations [16, 17, 21, 25, 34]. The lack of gender-segregated toilets was a significant challenge, which forced women and girls to share facilities with men, reducing privacy and increasing discomfort during menstruation [21]. Sommer et al. [35] indicated that in many displacement camps, adherence to segregation rules is rarely followed, leaving women and girls vulnerable to intrusion while using communal latrines. Similarly, Uwimana [17] and Nielsen [20] highlighted that the lack of women-friendly facilities made it difficult for girls to manage their periods safely and privately. Moreover, poor infrastructure in many WASH facilities, such as the absence of doors or private spaces for changing menstrual products, further contributes to these difficulties [25].

A consistent water supply is another critical issue, as many facilities fail to provide sufficient water for cleaning reusable pads or maintaining basic hygiene [20, 29]. Without reliable access to water, girls and women cannot effectively manage their menstruation, leading to hygiene-related health risks [29]. This problem is particularly acute in schools, where the absence of water forces many girls to leave early or skip school entirely, as noted by Schmitt et al. [21]. Additionally, the lack of lighting in WASH facilities, especially at night, raises security concerns for women, with Ene et al. [18] and Schmitt Schmitt et al. [21] highlighting that unsafe conditions increase the risk of gender-based violence. Disposal of menstrual waste is another challenge, as inadequate disposal options lead to improper waste management, causing environmental hazards. Two studies reported that many women resort to throwing menstrual waste directly into latrines, which can cause blockages and sanitation issues [18, 21]. The infrastructural inadequacies in WASH facilities have far-reaching impacts, particularly on girls' education. Kemigisha et al. [24] and Nielsen [20] reported that inadequate WASH provisions in schools lead to frequent absenteeism, as girls cannot manage their menstruation effectively at school.

Lack of access to suitable menstrual products

Eight studies reported poor access to menstrual products among girls and women in refugee settings [11, 18, 20, 21, 24–26, 28]. Access to suitable menstrual products in refugee or displaced settings is influenced by a combination of economic, infrastructural, and cultural factors. Lack of access to suitable products in humanitarian settings is a significant challenge to the displaced girls and women in managing their menstruation, as outlined by Schmitt et al. [21]. The findings from Kemigisha et al. [24] and Wynne [11], highlighted the ongoing struggles for women and girls in refugee camps, noting that many lack both the physical materials and the infrastructure necessary for safe menstrual management. Similarly, Norelius [28] observed that the absence of appropriate facilities and supplies in camps in Uganda led to significant hygiene challenges for menstruating women.

Financial constraints for girls and women refugees hinder access to menstrual products. Many female refugees cannot afford basic menstrual products, forcing them to rely on less hygienic alternatives such as old clothes, paper, or other improvised materials [21, 25, 26]. Schmitt et al. [21] noted that sometimes, women must resort to "washing or soaking their pads solely in water", which is inadequate for maintaining proper hygiene. This challenge is echoed by Ivanova et al. [26], who pointed out that girls and women had challenges in accessing hygienic products, and relied on humanitarian organisations to supply pads. Futhermore, economic limitations often leave girls and women without the resources necessary to access quality menstrual products, contributing to further social exclusion and absenteeism from educational or work opportunities [26].

The availability of different menstrual products plays a significant role in access. Disposable pads are often the preferred choice in many settings but are not always available or provided through humanitarian aid [16, 17]. Cultural practices and preferences also influence product use. As Ene et al. [18] and Nielsen [20] explained, cultural taboos surrounding menstruation in specific communities prevent girls from using modern menstrual products, even when they are available. Sanduvac et al. [25] similarly noted that many girls and women in Tanzania lack affordable menstrual products, forcing them to use unsanitary alternatives, which leads to higher rates of school absenteeism. These findings are consistent across several regions, as Nielsen [20] noted, highlighting cultural norms' role in shaping how women manage their menstruation and the barriers they face in accessing suitable products.

Cultural and social stigma around menstruation

Four studies [11, 21, 24, 25] highlighted the impact of cultural and social stigma on MHM. The secrecy surrounding menstruation plays a significant role in limiting open conversations and education about menstrual health, particularly in resource-limited settings. Sanduvac et al. [25] highlighted how girls in Tanzania face substantial stigma regarding menstruation, which makes it difficult for them to manage their periods safely and privately. According to Sanduvac et al. [25], "girls overwhelmingly do not have any reliable support from families, teachers, or the community. They are on their own when they have their period, which jeopardises their school attendance and social interactions". This sense of isolation and shame creates an environment where girls are reluctant to seek help or guidance, further intensifying the challenges of menstrual management [25]. In a similar context, Schmitt et al. [21] found that displaced women in Nigeria experience deep-seated shame around menstruation, often leading to secretive and isolated management of their menstrual hygiene.

Cultural taboos surrounding menstruation also contribute to the social exclusion of women and girls. In refugee communities, menstruation was viewed as "unclean" or "impure," and this perception often led to the exclusion of women from cultural, social, and religious activities [11]. In Schmitt et al. [21], women in Nigeria expressed how menstruation reinforces their exclusion from daily life, with one participant stating, "If a woman cannot take care of herself well enough […] if she lets stains be seen, then they won't let her handle the cooking utensils". These cultural stigmas extend beyond social settings, reinforcing marginalisation during menstruation and creating further barriers for women and girls in their communities [11].

Kemigisha et al. [24], found that "menstruation was positioned as an uncomfortable topic" to discuss in families, and girls feared to inform their mothers. The stigma surrounding menstruation has a particularly detrimental impact on girls' education, limited leisure, exercise and self-isolation [24]. The fear of embarrassment, especially from menstrual accidents or the lack of proper menstrual products, drives many girls to miss school during their periods. Kemigisha et al. [24] emphasised how negative experiences related to menstruation, including a lack of preparedness and inadequate knowledge, lead to increased absenteeism among girls. The influence of stigma is also evident in how women manage their menstrual hygiene. Schmitt et al. [21] found that displaced women in Nigeria took extraordinary measures to hide their menstrual hygiene practices, often washing and drying their reusable menstrual materials in secret. This

secrecy, driven by social norms, often results in improper cleaning, increasing the risk of infections [24].

Environmental concerns about menstrual products

Five studies described the environmental concerns caused by menstrual products [11, 20, 21, 25, 26]. The environmental impact of MHM was influenced by the types of products used and their disposal methods [11, 20, 21, 25, 26]. Key areas of concern included reliance on disposable products, chemical exposure, and improper waste management [20, 21, 25].

Managing menstrual waste is a critical environmental issue, particularly in regions with inadequate waste disposal systems, such as refugee camps [21, 26]. Improper disposal can lead to blockages in sewage systems, pollution, and increased health risks. Schmitt et al. [21] noted that used menstrual products are often thrown into latrines in many displaced communities, causing blockages and complicating waste management efforts. This issue is further exacerbated in settings like Tanzania, where Sanduvac et al. [25] found that women often resort to burying or burning menstrual products, which can have harmful environmental effects.

Disposable pads and tampons often contain non-biodegradable materials such as plastics and synthetic fibres, and those products can take many years to break down in landfills, contributing to the growing problem of solid waste accumulation [21, 26]. Schmitt et al. [21] reported that displaced women in Nigeria primarily used disposable pads distributed by NGOs, but these products contributed to waste problems in areas with inadequate disposal infrastructure. Ivanova et al. [26] added that disposable menstrual products, commonly used in Uganda, further stressed rural areas already burdened waste management systems.

Many disposable menstrual products are treated with chemicals such as dioxins, and pose health risks and have environmental consequences when disposed of improperly [20, 21]. Schmitt et al. [21] highlighted the dangers of chemical leaching from disposable products into the soil and water sources, particularly in regions without proper waste disposal mechanisms. Nielsen [20] also discussed the environmental hazards posed by chemical exposure from menstrual waste in Tanzania, where insufficient disposal systems lead to potential contamination of local water supplies.

Reusable menstrual products, including cloth pads, cups, and period underwear, offer a more sustainable alternative to disposables, significantly reducing waste over time and having a lower environmental impact [11, 25]. For instance, menstrual cups can last up to 10 years, significantly reducing the number of disposable products that would otherwise end up in landfills. Sanduvac et al. [25] reported that dignity kits distributed in Tanzania contain reusable pads, which have reduced menstrual waste, though challenges persist in maintaining hygiene due to water shortages. Similarly, Wynne [11] emphasised the environmental benefits of reusable menstrual products in Burundi and Uganda, where these products help alleviate the environmental burden of waste generated by disposables.

Increasing awareness about the environmental impact of menstrual products and promoting sustainable alternatives are essential steps toward reducing the environmental footprint of MHM [11, 20]. Nielsen [20] argued that education is necessary to change consumer behaviour, particularly in rural areas where disposable products are often seen as the only option. By raising awareness of reusable products and proper disposal methods, communities can make more sustainable choices that benefit their health and the environment [20]. Wynne [11] echoed this sentiment, noting that education programs in East Africa have successfully promoted reusable products, reducing waste and encouraging more eco-friendly practices.

Intervention to improve the MHM

This scoping review revealed that 37.5% (n = 6) of the 16 studies included in this study implemented interventions to improve the MHM in the refugee camps in Burundi, Madagascar, Nigeria, Uganda, Tanzania and Somaliland [11, 16, 25, 29, 33, 36]. These interventions included providing menstrual products, improving WASH facilities, menstrual health education, community engagement and awareness, and healthcare training.

Provision of menstrual products

The provision of menstrual products was a critical intervention to improve menstrual health and hygiene among refugee girls and women in Africa. The MHM interventions in five studies focused on the distribution of menstrual hygiene products, including both disposable and reusable options [11, 25, 29, 33, 36]. The types of products distributed vary depending on the region, the needs of the population, and the capacity of organisations. In Uganda, Somaliland, and Madagascar, IFRRCS [33] distributed disposable sanitary pads for 1 month and reusable sanitary pads for up to 12 months with monthly distribution of consumables like soap and a combination of reusable/washable pads along with disposable pads. In Tanzania, the intervention implemented by Sanduvac et al. [25] distributed dignity kits (including AfriPads, soap, panties, body lotion, and wrap cloth) to adolescent refugee girls, with AfriPads usable for 12 + months. While in Burundi and Uganda, the intervention by Wynne [11] distributed reusable pads and menstrual cups.

Furthermore, a few studies (n = 3) found—through interviews—that humanitarian organisations provided menstrual products to girls and women in refugee camps [17, 21, 28]. In displaced and refugee settings, such as those described by Schmitt et al. [21], non-governmental organisations (NGOs) often distributed disposable pads to women and girls who otherwise lack access. Despite their popularity, disposable pads' sustainability and long-term viability have been called into question due to environmental and logistical concerns [21].

In response to the challenges associated with disposable pads, four studies focused on providing reusable menstrual products, which offer a more sustainable solution [11, 25, 33, 36]. Reusable pads and menstrual cups were distributed to female refugees and were particularly valuable in settings where women lack consistent access to menstrual products, as they can be washed and reused for several months or even years, reducing dependency on aid distributions [11, 25, 33]. In Tanzania, Sanduvac et al. [25] reported that dignity kits were distributed and included reusable pads, which helped reduce the environmental impact of menstrual waste while providing women with a long-term solution.

In Uganda, Somaliland and Madagascar, menstrual cups were distributed and gained traction as a sustainable menstrual product in refugee settings [33]. Furthermore, Wynne [11] highlighted that menstrual cups have been introduced in Uganda and Burundi to give women more autonomy over their menstrual health. However, the success of menstrual cups depends heavily on access to clean water and proper hygiene practices [33]. In some areas, the lack of adequate water and sanitation facilities hindered the effective use of menstrual cups, underscoring the need for integrated WASH interventions alongside product distribution [33].

Improvement of WASH facilities

Three interventional studies were conducted in Uganda and Tanzania, respectively, on improving access to clean water and sanitation facilities for girls and women to be able to manage their menstruations effectively [16, 25, 29]. In Uganda, the Cocoon Mini—a secure and private area designed for managing menstruation—has gained widespread acceptance and appeal among individuals who menstruate and the wider community [16]. By offering essential features such as waste bins, lighting, and water access, the Cocoon Mini has enhanced menstrual health management [16].

Managing menstruation hygienically becomes nearly impossible in areas where proper sanitation is lacking. In Tanzania, WASH infrastructures were improved by upgrading female toilets in Nyarugusu with MHM components and ensuring that those toilets were safe and secure [29]. In Nigeria, Schmitt et al. [21] highlighted the need for gender-segregated and menstruation-friendly toilets in refugee camps, noting that many women lack access to safe and private spaces to change their menstrual products. Additionally, providing water for washing reusable products and ensuring proper waste disposal systems have been essential to these interventions [16, 25]. Studies conducted by IFRRCS [33] and Nielsen [20] highlighted the importance of improving WASH infrastructure to help girls and women refugees manage their menstruation privately and hygienically.

Menstrual health education

Education has been a key component of improving menstrual health and hygiene interventions. Four intervention studies, of which two were conducted in Tanzania [25, 29], one in Uganda [36], and one in Burundi and Uganda [11] provided training to girls and women in refugee camps on menstrual hygiene and use of menstrual products. In school and community refugee settings, programs have been designed to teach girls and women about the menstrual cycle, proper hygiene practices, and how to use menstrual products effectively [11, 36]. Kuncio [36] reported on interventions in Uganda, where 99% of girls received education on menstrual hygiene and the use of AFRIpads. Wynne [11] noted that education campaigns in East Africa have promoted the use of MHM materials, such as reusable menstrual products, and provided information on maintaining proper hygiene during menstruation. Furthermore, this training included staff, men and boys, and other actors in the refugee camps [11].

Community engagement and awareness

Six studies found that engaging communities in conversations about menstruation were essential for reducing stigma and fostering a supportive environment for women and girls [11, 16, 20, 21, 29, 36]. Community-based education and sensitisation campaigns, such as those discussed by Nielsen [20], Schmitt et al. [21] and Sommer et al. [29], have been implemented to challenge these cultural norms and reduce the stigma surrounding menstruation. In three interventions, the community engagement campaigns involved both men and women to promote a better understanding of menstrual health as a natural and manageable part of life [11, 16, 36].

Training for healthcare providers

In two intervention studies conducted in Burundi, Uganda and Tanzania, healthcare providers have been trained to integrate menstrual health into broader reproductive health services [11, 29]. In Burundi and Uganda, Wynne [11] described how healthcare workers in refugee

camps have been trained to educate women about proper hygiene practices and how to use reusable products, thereby reducing the risk of infections and improving overall menstrual health. This integration ensures that menstrual health is treated as an important part of women's healthcare rather than a separate issue [11].

In Tanzania, a pilot study by Sommer et al. [29] enhanced the staff capacity for MHM through a comprehensive approach that involved training, cross-sector coordination, and ongoing advocacy. The pilot emphasised the importance of building staff confidence in discussing MHM, particularly through training sessions that broke down taboos and discomfort, especially among male staff [29]. These sessions also clarified that MHM is not solely the responsibility of the WASH sector but requires coordination across the health, education, and protection sectors [29].

Tailored technical support was provided to help staff implement practical MHM interventions in Tanzania, such as adapting toilets to be MHM-friendly and distributing necessary supplies [29]. The pilot study demonstrated that enhancing staff capacity in MHM in emergencies required training, cross-sector collaboration, technical assistance, and leadership engagement to create a sustainable and effective response [29]. Similarly, in Burundi and Uganda, training healthcare providers and refugee camp staff played a crucial role in equipping camp workers with the knowledge, practical aspects of MHM and cultural sensitivity needed to address menstrual hygiene effectively [11].

In Burundi and Uganda, female staff members took a leading role in disseminating MHM information, especially when male staff members felt uncomfortable discussing menstruation [11]. Male staff were involved in the operational aspects, such as waste management, while female staff and volunteers handled direct communication with beneficiaries, ensuring culturally appropriate engagement [11]. Those tactics underscored the importance of culturally sensitive, gender-specific approaches and emphasised that well-trained staff are crucial for successfully implementing MHM programs in refugee camps [11]. Understanding local beliefs, taboos, preferences, and consultations with women and girls were encouraged to tailor MHM interventions to the community's needs [11].

Discussion

This scoping review revealed a variation in MHM knowledge and practices among girls and women refugees in Africa. The literature highlights the need for more information about menstrual hygiene products from healthcare professionals and manufacturers [37]. Lack of knowledge about menstruation and proper MHM practices is prevalent among refugee women and girls [22, 24]. Education and awareness campaigns are needed to address knowledge gaps and promote informed choices [38, 39]. In this study, menstrual products included disposable, reusable tampons and menstrual cups. The literature shows that factors influencing product choice include comfort, cost, environmental impact, and health concerns [40], and disposable pads are the most frequently used [38, 40].

MHMs in refugee settings face numerous challenges, such as limited access to safe, private facilities and, inadequate supplies of menstrual products, cultural and social stigma. Evidence shows that the prevalence of inadequate access to sanitary pads during humanitarian crises is estimated at 34% [30]. Furthermore, the Cultural beliefs, stigma, and fear of sexual violence restrict women's activities during menstruation [41]. Lack of knowledge about menstrual health and inadequate infrastructure further exacerbate these issues [42–44].

In countries like the United States and the United Kingdom (UK), researchers have identified that lack of access to menstrual products, sanitation facilities and education—a significant issue known as period poverty—affects particularly marginalised individuals who menstruate [45–48]. Period poverty is a global issue, and in the UK, a lack of resources and the stigma surrounding menstrual health significantly contribute to 49% of menstruators missing educational opportunities because they cannot access essential menstrual products, around 10% of individuals cannot afford menstrual management products (MMP), and 15% have difficulty meeting their needs [48]. As a result, 12% resort to improvisation in place of using appropriate MMP due to financial constraints [48].

Use of unsafe or unsanitary menstrual products is associated with prolonged health challenges, including a heightened risk of infections, skin irritation, and vaginal issues [49–51]. These problems can significantly impact women's physical well-being and may lead to complications that necessitate medical attention [49]. Mental health challenges also occur due to the shame, stigma, and social isolation linked to menstruation, contributing to increased stress, depression, and anxiety [49, 51, 52].

Menstrual products pose significant environmental concerns due to insufficient waste disposal systems and a lack of women-friendly spaces in camps, further complicating MHM [42, 53]. Conventional disposable products contain substantial amounts of plastic, contributing to long-term environmental pollution [54, 55]. These products can take decades to degrade and may release harmful chemicals, including phthalates and volatile organic compounds [56]. The environmental impact varies among product types, with menstrual cups and reusable

options generally having lower environmental footprints [55]. Biodegradable alternatives made from natural fibres like cotton, jute, and bamboo are being developed to address these issues [56–58]. Proper disposal and waste management of menstrual products remain challenges, with flushing and incineration posing additional environmental risks [48, 58]. Increasing public awareness and promoting sustainable product choices are crucial for mitigating the environmental impact of menstrual products [54, 59].

MHM interventions for refugee girls and women primarily focused on distributing menstrual products and providing education. Those MHM interventions aim to improve menstrual health by addressing those involved's physical and educational needs. Some evidence also suggests that these interventions can positively influence school attendance [60, 61]. The acceptability of MHM interventions varies, with adult women generally prefer reusable pads, while younger girls often favour disposable options [62]. To improve the effectiveness of these interventions, it is crucial to consider local contexts and actively involve beneficiaries in the design process and addressing broader issues, such as disposal methods and improving sanitation facilities, is essential [63, 64]. By taking these factors into account, MHM interventions can be more effectively tailored to meet the needs of girls and women in refugee settings. However, empirical evidence is lacking on the most effective interventions in humanitarian emergencies [7]. Sustainable interventions should move beyond short-term 'kit culture' to include policy support, community participation, and capacity building [65].

Implications to research, policies, and women health

This study identified significant gaps in MHM among refugee populations, highlighting the urgent need for further research. Future studies should investigate the long-term effects of inadequate MHM on both physical and mental health, particularly in humanitarian contexts. Evaluating the sustainability and effectiveness of current interventions to enhance menstrual hygiene practices is essential. Additionally, qualitative research should delve into cultural perceptions and the social stigma surrounding menstruation within refugee communities to develop culturally appropriate interventions. The environmental impact of disposable menstrual products in refugee camps also requires further exploration to identify sustainable alternatives suitable for resource-limited settings. Furthermore, in light of social stigma, research should assess how engaging men can help reduce barriers to MHM.

Policymakers must integrate MHM into humanitarian aid programs to ensure access to menstrual products, education, and gender-segregated WASH facilities. Standardising the distribution of menstrual products and incorporating menstrual health education in refugee schools are vital steps. Community-based awareness initiatives should involve both men and women to tackle stigma. Subsidising reusable products can improve accessibility.

Addressing the challenges of MHM will enhance health outcomes, reduce school absenteeism, and promote dignity and well-being. Safe WASH facilities can also mitigate the risks of gender-based violence. A comprehensive approach is essential to prioritise MHM in humanitarian and public health programs, ensuring the rights and dignity of displaced women and girls are upheld.

Limitations

Despite the significant insights provided by this study, limitations should be noted. Most of the reviewed research utilised qualitative methods, which restricts the generalizability of the findings to broader populations. The availability of data on the long-term health impacts of poor MHM was also limited, highlighting the need for longitudinal studies. Furthermore, some interventions were not rigorously evaluated, making it challenging to determine their long-term effectiveness. Cultural factors and social stigmas may have influenced self-reported data, potentially leading to response biases in the studies reviewed. Future research should incorporate a wider range of study locations to address these limitations, employ mixed-method approaches, and focus on the long-term outcomes of MHM interventions.

Conclusion

MHM is a significant challenge in refugee settings in Africa. This issue is compounded by inadequate access to menstrual products, insufficient hygiene education, and cultural taboos. As a result, women and girls often resort to unsafe alternatives, increasing their vulnerability to infections and other health risks. Although interventions such as distributing reusable products and providing menstrual health education show promise, their long-term sustainability and impact have not been thoroughly examined. Understanding the barriers to sustained use and adherence is crucial for ensuring the success of these programmes. Further research is needed to explore how tailored community-based programmes can effectively address stigma and promote positive menstrual health behaviours.

Integrating menstrual health into policy frameworks related to public health, education, and sanitation is vital. Strengthening policy accountability and increasing funding for MHM initiatives in humanitarian responses can enhance access to menstrual hygiene resources.

This study highlights the necessity for a comprehensive, multisectoral approach to MHM, which includes education, infrastructure improvements, and policy reform. Tackling these issues will contribute to gender equality, improved health outcomes, and enhanced dignity for refugee women and girls.

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References

1. UNFPA. Menstrual hygiene management among refugee women and girls in Türklye: UNFPA. 2022.
2. ACMHM. MHM and the Sustainable Development Goals: African Coalition for Menstrual Health Management (ACMHM). 2020. Available from: https://acmhm.org/goals/.
3. Sommer M, Torondel B, Hennegan J, Phillips-Howard PA, Mahon T, Motivans A, et al. How addressing menstrual health and hygiene may enable progress across the sustainable development goals. Glob Health Action. 2021;14(1):1–10. https://doi.org/10.1080/16549716.2021.1920315.
4. Budhathoki SS, Bhattachan M, Castro-Sánchez E, Sagtani RA, Rayamajhi RB, Rai P, et al. Menstrual hygiene management among women and adolescent girls in the aftermath of the earthquake in Nepal. BMC Womens Health. 2018;18:1–8. https://doi.org/10.1186/s12905-018-0527-y.
5. Daniel N, Kejela G, Fantahun F, Desalegn M, Guteta F. Menstrual hygiene management practice and its associated factors among in-school adolescent girls in Western Ethiopia. Contracept Reprod Med. 2023;8(1):1–12. https://doi.org/10.1186/s40834-022-00196-7.
6. Viscek N. Menstrual hygiene management in the context of displacement: challenge s and next steps. GHAR. 2020;1(5):65–8.
7. VanLeeuwen R, Torondel B. Exploring menstrual practices and potential acceptability of reusable menstrual underwear among a middle eastern population living in a refugee setting. Int J Womens Health. 2018;10:349–60. https://doi.org/10.2147/IJWH.S152483.
8. Schmitt ML, Wood OR, Clatworthy D, Rashid SF, Sommer M. Innovative strategies for providing menstruation-supportive water, sanitation and hygiene (WASH) facilities: learning from refugee camps in Cox's bazar, Bangladesh. Confl Health. 2021;15:1–12. https://doi.org/10.1186/s13031-021-00346-9.
9. Chidakwa N. Menstrual hygiene management among vulnerable rural adolescent schoolgirls in South Africa's rural learning ecologies. Futur Educ. 2024;4(3):18–41. https://doi.org/10.57125/FED.2024.09.25.02.
10. Chikulo BC. An exploratory study into menstrual hygiene management amongst rural high school for girls in the North West Province, South Africa. Afr Popul Stud. 2015;29(2):1971–87. https://doi.org/10.11564/29-2-777.
11. Wynne E. Menstrual hygiene management in the refugee context: Learning from piloted interventions in East Africa: Refugee Law Initiative, University of London. 2022.
12. Mann S, Byrne SK. Period poverty from a public health and legislative perspective. Int J Environ Res Public Health. 2023;20(23):7118. https://doi.org/10.3390/ijerph20237118.
13. Schmitt ML, Clatworthy D, Ratnayake R, Klaesener-Metzner N, Roesch E, Wheeler E, et al. Understanding the menstrual hygiene management challenges facing displ aced girls and women: findings from qualitative assessments in Myanmar and Lebanon. Confl Heal. 2017;11(9):1–11. https://doi.org/10.1186/s13031-017-0121-1.
14. USCRI. Three reasons to prioritize menstrual health in displacement settings: US Commitee for Refugees and Immigrants (USCRI); 2024. Available from: https://refugees.org/three-reasons-to-prioritize-menstrual-health-in-displacement-settings/.
15. Soeiro RE, Rocha L, Surita F, Bahamondes L, Costa ML. Period poverty: Menstrual health hygiene issues among adolescent and y oung Venezuelan migrant women at the northwestern border of Brazil. Reprod Health. 2021;18(238):1–9. https://doi.org/10.1186/s12978-021-01285-7.
16. Beeman A, Kwesiga J, Ippoliti N, Bhandari T, Pandya G, Acam FA, et al. Using human-centered design to co-design dedicated menstrual health spaces with people who menstruate in Bidi Bidi refugee settlement, Uganda: Learnings for further adaptation and scale in humanitarian settings. BMC Womens Health. 2023;23(1):1–16. https://doi.org/10.1186/s12905-023-02421-0.
17. Uwimana A. Menstrual hygiene management in emergency situations: A case study of Kigeme refugee camp. Southern Rwanda: Universithy of Rwanda; 2014.
18. Ene N, Nwosu U, Adedigba CG. Assessment of knowledge, attitude, and practice of menstrual hygiene management among adolescent girls and young women in an internally displaced person camp in Federal Capital Territory, Nigeria. J Res Humanit Soc Sci. 2023;11(5):1–9.
19. Calderón-Villarreal A, Schweitzer R, Kayser G. Social and geographic inequalities in water, sanitation and hygiene access in 21 refugee camps and settlements in Bangladesh, Kenya, Uganda, South Sudan, and Zimbabwe. Int J Equity Health. 2022;21(1):1–18. https://doi.org/10.1186/s12939-022-01626-3.
20. Nielsen JK. Women and girls' experiences with safety, hygiene and sanitation in connection with menstrual health management in Nyarugusu refugee camp: University of Copenhagen 2017.
21. Schmitt M, Gruer C, Clatworthy D, Kimonye C, Peter DE, Sommer M. Menstrual material maintenance, disposal, and laundering challenges among displaced girls and women in Northeast Nigeria. J Water Sanit Hyg Dev. 2022;12(7):517–28. https://doi.org/10.2166/washdev.2022.213.
22. Majed R. Menstrual hygiene management among syrian refugee Women in the Bekaa. Oxfam Research Reports, 2020.
23. Hawkey A, Ussher J, Perz J, Metusela C. Experiences and constructions of menarche and menstruation among migrant and refugee women. Qual Health Res. 2016;27(10):1–18. https://doi.org/10.1177/1049732316672639.
24. Kemigisha E, Rai M, Mlahagwa W, Nyakato VN, Ivanova O. A qualitative study exploring menstruation experiences and practices among adolescent girls living in the Nakivale Refugee settlement, Uganda. Int J Environ Res Public Health. 2020;17(18):1–12. https://doi.org/10.3390/ijerph17186613.
25. Sanduvac ZMT, Panga M, Banekwa B, Charles C. Menstrual Hygiene Management (MHM) for Education in Emergencies (EiE): A Study for Plan Intentional Tanzania: Plan International Tanzania; 2017.
26. Ivanova O, Rai M, Mlahagwa W, Tumuhairwe J, Bakuli A, Nyakato VN, et al. A cross-sectional mixed-methods study of sexual and reproductive health knowledge, experiences and access to services among refugee adolescent girls in the Nakivale refugee settlement, Uganda. Reprod Health. 2019;16(35):1–11. https://doi.org/10.1186/s12978-019-0698-5.

27. Crankshaw TL, Freedman J, Mutambara VM, Rajah Y. "I still don't know how someone gets pregnant": determinants of poor reproductive health among young female refugees in South Africa. BMC Womens Health. 2024;24(10):1–11. https://doi.org/10.1186/s12905-023-02847-6.
28. Norelius H. Managing menstruation during displacement: a mixed methods study investigating menstrual hygiene management in Rhino refugee settlement. Uganda: University of Copenhagen; 2017.
29. Sommer M, Margaret LS, Tom O, Penninah M, Magdalena M, Clatworthy D, et al. Pilot testing and evaluation of a toolkit for menstrual hygiene manage ment in emergencies in three refugee camps in Northwest Tanzania. J Int Humanit Act. 2018;3(6):1–14. https://doi.org/10.1186/s41018-018-0034-7.
30. Patel K, Panda N, Sahoo KC, Saxena S, Chouhan NS, Singh P, et al. A systematic review of menstrual hygiene management (MHM) during humanitarian crises and/or emergencies in low-and middle-income countries. Front Public Health. 2022;10:1–13. https://doi.org/10.3389/fpubh.2022.1018092.
31. Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. Implement Sci. 2010;5(1):69. https://doi.org/10.1186/1748-5908-5-69.
32. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8(1):19–32. https://doi.org/10.1080/1364557032000119616.
33. IFRRCS. Menstrual hygiene management (MHM) in emergencies: Consolidated report: International Federation of Red Cross and Red Crescent Societies [IFRRCS] 2016.
34. Sibanda W, Hansen MM, Mukwada G. The appropriation of African indigenous knowledge system in WASH activities by women at Tongogara refugee camp, Zimbabwe. Cog Soc Sci. 2022;8(1):1–17. https://doi.org/10.1080/23311886.2022.2108229.
35. Sommer M, Margaret LS, Clatworthy D, Bramucci G, Erin W, Ratnayake R. What is the scope for addressing menstrual hygiene management in compl ex humanitarian emergencies? Glob Rev Waterlines. 2016;35(3):245–64. https://doi.org/10.3362/1756-3488.2016.024.
36. Kuncio T. Pilot study findings on the provision of hygiene kits with reusable sanitary pads: Testing the appropriateness and acceptability of AFRIpads reusable sanitary pads in southwestern (Ugandan) refugee context among schoolgirls 2018.
37. Parent C, Tetu C, Barbe C, Bonneau S, Gabriel R, Graesslin O, et al. Menstrual hygiene products: a practice evaluation. J Gynecol Obstet Hum Reprod. 2022;51(1): 102261. https://doi.org/10.1016/j.jogoh.2021.102261.
38. Kim HJ, Choi SY. Status of use of menstrual hygiene products and genital organ hygiene management in unmarried women. Korean J Women Health Nurs. 2018;24(3):265. https://doi.org/10.4069/KJWHN.2018.24.3.265.
39. Pednekar S, Some S, Rivankar K, Thakore R. Enabling factors for sustainable menstrual hygiene management practice s: a rapid review. Discov Sustain. 2022. https://doi.org/10.1007/s43621-022-00097-4.
40. Choi H, Lim N-K, Jung H, Kim O, Park H-Y. Use of menstrual sanitary products in women of reproductive age: Korea nurses' health study. Osong Public Health Res Perspect. 2021;12(1):20–8. https://doi.org/10.24171/j.phrp.2021.12.1.04.
41. Pandit K, Hasan MJ, Islam T, Rakib TM. Constraints and current practices of menstrual hygiene among Rohingya adolescent girls. Heliyon. 2022;8: e09465. https://doi.org/10.1016/j.heliyon.2022.e09465.
42. Hirani SAA. Barriers to women's menstrual hygiene practices during recurrent disasters and displacement: a qualitative study. Int J Environ Res Public Health. 2024;21(2):1–13. https://doi.org/10.3390/ijerph21020153.
43. Tufail Z, Ahmer W, Gulzar S, Hasanain M, Shah HH. Menstrual hygiene management in flood-affected Pakistan: addressing challenges and ensuring women's health and dignity. Front Glob Women's Health. 2023;4:1238526. https://doi.org/10.3389/fgwh.2023.1238526.
44. Anbesu EW, Asgedom DK. Menstrual hygiene practice and associated factors among adolescent girls in sub-Saharan Africa: a systematic review and meta-analysis. BMC Public Health. 2023;23(1):33. https://doi.org/10.1186/s12889-022-14942-8.
45. Crawford BJ, Johnson ME, Karin ML, Strausfeld L, Waldman EG. The ground on which we all stand: a conversation about menstrual equity law and activism. Mich J Gender & L. 2019;26:341.
46. Jalali R. Global health priorities and the neglect of menstrual health and hygiene: the role of issue attributes. Soc Dev. 2023;9(4):317–45. https://doi.org/10.1525/sod.2023.9.4.317.
47. Cardoso LF, Scolese AM, Hamidaddin A, Gupta J. Period poverty and mental health implications among college-aged women in the United States. BMC Womens Health. 2021;21:1–7. https://doi.org/10.1186/s12905-020-01149-5.
48. Blair LAG, Bajón-Fernández Y, Villa R. An exploratory study of the impact and potential of menstrual hygiene management waste in the UK. Clean Eng Technol. 2022;7:1–7. https://doi.org/10.1016/j.clet.2022.100435.
49. Jaafar H, Ismail SY, Azzeri A. Period poverty: a neglected public health issue. Korean J Fam Med. 2023;44(4):183. https://doi.org/10.4082/kjfm.22.0206.
50. Borg SA, Bukenya JN, Kibira SP, Nakamya P, Makumbi FE, Exum NG, et al. The association between menstrual hygiene, workplace sanitation practices and self-reported urogenital symptoms in a cross-sectional survey of women working in Mukono District, Uganda. PLoS ONE. 2023;18(7):e0288942. https://doi.org/10.1371/journal.pone.0288942.
51. Nabwera HM, Shah V, Neville R, Sosseh F, Saidykhan M, Faal F, et al. Menstrual hygiene management practices and associated health outcomes among school-going adolescents in rural Gambia. PLoS ONE. 2021;16(2):e0247554. https://doi.org/10.1371/journal.pone.0247554.
52. Muhaidat N, Al Karmi J, Ibrahim OB, Raiq NA, Alhanbali AE, Ghanem HH, et al. Menstrual hygiene practice needs, and depression among refugee women in Jordan: a cross-sectional study. BMJ Open. 2024;14(12):e083824. https://doi.org/10.1136/bmjopen-2023-083824.
53. Warashinta D, Astari AM, Merdikawati A. Analysis of the use of menstrual pad, tampons, and menstrual cup during menarche. J Commun Health Prev Med. 2021;1(2):24–31. https://doi.org/10.21776/ub.jochapm.2021.001.02.4.
54. Peberdy E, Jones A, Green D. A study into public awareness of the environmental impact of menstrual products and product choice. Sustainability. 2019;11(473):1–16. https://doi.org/10.3390/su11020473.
55. Fourcassier S, Douziech M, Pérez-López P, Schiebinger L. Menstrual products: a comparable life cycle assessment. Clean Environ Syst. 2022;7:1–8. https://doi.org/10.1016/j.cesys.2022.100096.
56. Kumar CKA, Kumar GS, Subrahmanyam P, Srinivas B, Parameshwar K. A comprehensive review on biodegradable sanitary napkins for sustainab le menstrual health and environmental hygiene. Adv Pharma J. 2023;8(5):119–27. https://doi.org/10.31024/apj.2023.8.5.3.
57. Hand J, Hwang C, Vogel W, Lopez C, Hwang S. An exploration of market organic sanitary products for improving menst rual health and environmental impact. J Water, Sanit Hyg Dev. 2023;13(2):63–77. https://doi.org/10.2166/washdev.2023.020.
58. Ghosh I, Rakholia D, Shah K, Bhatt D, Das M. Environmental perspective on menstrual hygiene management along with the movement towards biodegradability: a mini-review. J Biomed Res Environ Sci. 2020;1(5):122–6. https://doi.org/10.37871/jels1129.
59. Upson K, Shearston JA, Kioumourtzoglou M-A. Menstrual products as a source of environmental chemical exposure: a review from the epidemiologic perspective. Curr Envir Health Rpt. 2022;9(1):38–52. https://doi.org/10.1007/s40572-022-00331-1.
60. Hennegan J, Montgomery P. Do menstrual hygiene management interventions improve education and ps ychosocial outcomes for women and girls in low and middle income countries? A systematic review. PLoS ONE. 2016;11(2): e0146985. https://doi.org/10.1371/journal.pone.0146985.
61. Hamada H, Ninohei M, Yamaji N, Ota E. Effects of interventions for menstrual health and hygiene management for adolescent girls: a systematic review and meta-analysis. Pac Rim Int J Nurs Res. 2024;28(2):356–76. https://doi.org/10.60099/prijnr.2024.265202.
62. Kambala C, Chinangwa A, Chipeta E, Torondel B, Morse T. Acceptability of menstrual products interventions for menstrual hygiene management among women and girls in Malawi. Reprod Health. 2020;17(185):1–12. https://doi.org/10.1186/s12978-020-01045-z.
63. Shannon AK, Melendez-Torres G, Hennegan J. How do women and girls experience menstrual health interventions in low- and middle-income countries? Insights from a systematic review and qualitative metasynthesis. Cult Health Sex. 2020;23(5):624–43. https://doi.org/10.1080/13691058.2020.1718758.
64. Sommer M, Garazi Z, Margaret LS, Samantha K, Phillips-Howard P. Advancing the measurement agenda for menstrual health and hygiene

in terventions in low- and middle-income countries. J Glob Health. 2020;10(1):1–4. https://doi.org/10.7189/jogh.10.010323.
65. Tellier M, Farley A, Jahangir A, Nakalema S, Nalunga D, Tellier S. Practice note: menstrual health management in humanitarian settings. In: The Palgrave handbook of critical menstruation studies, Singapore: Springer; 2020. p. 593–608.

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