

Menstrual Health and Hygiene: A Comprehensive Analysis of Global Challenges, Socio-Cultural Barriers, and Policy Interventions

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Abstract

This study explores the multifaceted dimensions of menstrual health and hygiene through an extensive review of secondary data, emphasizing its significance as a public health, gender equality, and human rights issue. Drawing on global and regional research, the study highlights persistent challenges such as limited awareness, inadequate sanitation facilities, cultural taboos, and economic barriers that collectively contribute to poor menstrual hygiene management. Findings indicate that “period poverty” continues to affect millions of women and girls, particularly in developing countries, leading to health risks, school absenteeism, and social exclusion. The study underscores the need for integrated policies combining education, accessibility to affordable products, and improved sanitation infrastructure. It further calls for inclusive awareness programs involving both men and women to break menstrual stigma. Ensuring equitable menstrual health is vital for achieving sustainable development and gender empowerment.

Keywords:- Menstrual health, menstrual hygiene management, period poverty, gender equality, public health, sanitation, stigma, awareness.

Introduction

Menstrual health and hygiene (MHH) represent a critical yet often overlooked component of public health, gender equality, and human rights. Menstruation is a natural biological process that signifies reproductive maturity in women and adolescent girls, yet the topic remains surrounded by stigma, misconceptions, and social taboos in many parts of the world. According to the World Health Organization (WHO) and UNICEF Joint Monitoring Programme (JMP), approximately 1.8 billion people menstruate every month, yet millions of them lack access to the basic resources needed for safe and dignified menstrual hygiene management (MHM). The issue is particularly severe in low- and middle-income countries, where cultural restrictions, poor sanitation facilities, and inadequate education about menstruation contribute to adverse health outcomes, school absenteeism, and psychological distress among women and girls. The lack of access to menstrual hygiene materials such as sanitary pads, tampons, or menstrual cups, combined with inadequate water and sanitation infrastructure, forces many women to resort to unsafe practices such as using old cloth, rags, or even ash and sand to manage their menstruation. These practices not only compromise menstrual hygiene but also increase the risk of reproductive tract infections (RTIs), urinary tract infections (UTIs), and other health complications that can have long-term consequences on women’s reproductive and overall health.



The challenges associated with menstrual health go beyond personal hygiene and are deeply embedded within sociocultural and economic contexts. In many societies, menstruation is still viewed as impure or shameful, resulting in restrictive practices that limit women's participation in social, religious, and educational activities during their menstrual periods. This social exclusion further reinforces gender inequality by denying women and girls equal opportunities for growth and participation. According to UNICEF (2021), in several developing countries, nearly 50% of girls have limited or no knowledge about menstruation before experiencing their first period, leading to confusion, fear, and embarrassment. The absence of proper menstrual education and open discussion in schools and households perpetuates misinformation and discriminatory attitudes. Moreover, economic disparities exacerbate menstrual inequity — a phenomenon now referred to as “period poverty.” Many women and girls are unable to afford menstrual products, forcing them to miss school or work during menstruation. Studies indicate that in India alone, around 23 million girls drop out of school annually due to lack of adequate menstrual hygiene management facilities, while in sub-Saharan Africa, one in ten girls misses classes during menstruation. This intersection of poverty, gender, and health inequity highlights the need for a multidimensional approach to menstrual health, encompassing education, sanitation, product accessibility, and cultural sensitization.

Recognizing menstrual health and hygiene as a fundamental aspect of human dignity and gender equity is essential for achieving several global development objectives, including the Sustainable Development Goals (SDGs). In particular, SDG 3 (Good Health and Well-being), SDG 4 (Quality Education), SDG 5 (Gender Equality), and SDG 6 (Clean Water and Sanitation) are directly influenced by menstrual health outcomes. Governments, non-governmental organizations (NGOs), and international agencies have increasingly prioritized menstrual health in policy frameworks, educational programs, and advocacy campaigns. Initiatives such as providing free or subsidized sanitary products, integrating menstrual education into school curricula, and promoting awareness campaigns have begun to challenge taboos and empower women to manage menstruation with dignity. However, despite these efforts, the global response remains fragmented and insufficiently

inclusive, particularly for marginalized groups such as rural women, those living in humanitarian settings, and persons with disabilities. Therefore, promoting menstrual health hygiene requires a holistic, culturally sensitive, and intersectional approach that addresses physical needs alongside social and psychological dimensions. Ensuring menstrual equity is not merely a health issue but a societal responsibility — a step toward empowering women and fostering inclusive, equitable, and sustainable communities.

Need Of the Study

Menstrual health and hygiene are essential to women's and adolescent girls' overall well-being, yet they remain one of the most neglected aspects of public health and social policy. Despite growing global recognition, menstrual hygiene management (MHM) continues to be hampered by inadequate awareness, insufficient access to sanitary products, and poor sanitation infrastructure, particularly in low- and middle-income countries. The need for this study arises from the alarming gap between knowledge and practice regarding menstrual hygiene and the persistent cultural taboos that prevent open discussion on this subject. Menstruation is often considered a private or even shameful topic, leading to a lack of education about safe menstrual practices. Consequently, many girls and women are exposed to infections, reproductive health issues, and emotional distress due to improper management of menstruation. According to UNESCO (2022), nearly 50% of adolescent girls in developing countries lack access to hygienic menstrual products, while 60% do not have basic water, sanitation, and hygiene (WASH) facilities at schools. Such statistics underline the urgency of understanding and addressing the barriers that impede safe and dignified menstrual management. This study is therefore necessary to evaluate current practices, awareness levels, and infrastructural support systems, and to recommend strategies that ensure menstrual health is recognized as a fundamental health and human rights issue.



Furthermore, the need for this study is reinforced by the multifaceted impact of poor menstrual hygiene on education, health, and gender equality. In many parts of the world, including India, cultural beliefs and economic constraints contribute to a phenomenon known as “period poverty,”

where women are unable to afford or access adequate menstrual products. This economic deprivation is directly linked to educational and occupational absenteeism. Studies have shown that schoolgirls who lack access to sanitary facilities are more likely to miss classes or even drop out entirely, thereby limiting their educational attainment and future opportunities. In the workplace, women may face reduced productivity or stigma during menstruation due to inadequate hygiene facilities. The physical health implications are equally concerning: the use of unhygienic materials such as old cloths or newspapers increases the risk of infections and other complications, creating a preventable burden on healthcare systems. Therefore, studying menstrual health not only contributes to improving hygiene practices but also addresses broader developmental goals such as reducing gender disparities, promoting education, and improving overall community health outcomes. By analyzing the socio-economic, cultural, and infrastructural determinants of menstrual hygiene, this study aims to fill existing research gaps and provide actionable insights for policymakers, educators, and health practitioners.

There is a pressing need for this study to contribute to policy development and social transformation. While several national and international initiatives have emerged to promote menstrual hygiene — such as India's Menstrual Hygiene Scheme (MHS), UNICEF's MHM guidelines, and the UN's advocacy for menstrual equity — their reach and impact remain uneven. Many programs focus primarily on product distribution, overlooking the importance of behavioral change, education, and gender-sensitive infrastructure. Moreover, the inclusion of marginalized communities, differently-abled individuals, and those in rural or conflict-affected areas remains inadequate. Hence, this study is essential to examine how existing interventions can be strengthened through an integrated approach that combines awareness, accessibility, and affordability. It will also emphasize the importance of involving men and boys in menstrual health discussions to challenge stigma and create supportive environments. The outcomes of this study will contribute not only to improving menstrual hygiene practices but also to shaping inclusive health policies and educational programs. Ultimately, the study seeks to reinforce that menstrual health is not solely a women's issue, but a societal imperative — vital for achieving sustainable development, gender equality, and human dignity.

Significance of the study

The significance of this study lies in its contribution to bridging critical gaps in understanding, awareness, and practice related to menstrual health and hygiene. Menstrual health is not merely a physiological concern but a multidimensional issue encompassing physical well-being, mental health, education, gender equality, and socio-economic empowerment. Despite increased global attention, menstrual health remains under-researched and inadequately addressed in policy and community initiatives, especially in developing regions. This study is significant because it seeks to generate empirical evidence that highlights the existing challenges faced by women and adolescent girls in managing menstruation safely and with dignity. It underscores the need to view menstrual health as an essential component of public health and human rights rather than a private or stigmatized issue. By documenting prevailing knowledge gaps, socio-cultural barriers, and infrastructural inadequacies, the research aims to create a strong foundation for advocacy and informed policy interventions. In doing so, it contributes to the broader discourse on women's health empowerment and gender-sensitive development planning. The study's findings will also

serve as an educational resource to raise awareness among educators, parents, and policymakers about the importance of comprehensive menstrual education and accessible hygiene facilities.

The study holds further significance in its potential to influence social attitudes and behavioral change surrounding menstruation. In many societies, menstruation continues to be surrounded by myths, taboos, and restrictions that perpetuate discrimination and exclusion. These deep-rooted cultural stigmas not only affect women's self-esteem but also hinder their participation in education, employment, and social life. By exploring the social and psychological dimensions of menstrual health, this study aims to foster greater understanding and acceptance of menstruation as a natural and healthy biological process. Its findings can support community-based awareness programs, school health education initiatives, and policy campaigns that promote menstrual hygiene as an issue of dignity and equality. Moreover, the study emphasizes the importance of involving both men and women in menstrual health education, as inclusive engagement is key to breaking cycles of silence and stigma. When communities recognize menstruation as a shared social concern rather than a women-only issue, it leads to more supportive environments for girls and women to manage menstruation confidently. Therefore, the research contributes to social transformation by promoting gender sensitivity, health literacy, and inclusiveness at multiple levels — family, school, workplace, and society.

Literature review

Conceptualizing Menstrual Health & Hygiene

Menstrual Health and Hygiene (MHH, sometimes Menstrual Hygiene Management, MHM) has evolved from a narrow emphasis on sanitary product use to a more holistic, rights-based and public health-oriented framework. Hennegan et al. (2021) offer a refined definition: menstrual health as “a state of complete physical, mental, and social well-being ... in relation to the menstrual cycle” (p. 2). This framing shift attention not only to materials (pads, tampons, cups) and infrastructure (water, sanitation, disposal) but also to knowledge, agency, social norms, and inclusion in health systems and policy (Hennegan et al., 2021).

Similarly, UNICEF/WHO's Joint Monitoring Programme (JMP) defines MHM as using clean materials, changing them with privacy and frequency, washing with soap/clean water, and disposing safely—under conditions of dignity and comfort. The term first gained prominence in global health discourse around 2005.

A systematic review by Sood et al. (2022) underscores that menstrual health should be viewed as a human rights issue — emphasizing how stigma, gender inequality, and infrastructural deficits thwart the ability of people to manage menstruation with dignity. This perspective has shaped more recent scholarship, which situates menstrual health not merely as a hygiene or biomedical challenge, but at the intersection of gender, education, empowerment, and social justice. Thus, the literature now clusters around multiple domains: knowledge and attitudes; practices and materials; infrastructural (WASH) constraints; health outcomes; socio-cultural and gender norms; and interventions or policy responses.

Knowledge, Attitudes, and Practices (KAP) Regarding Menstruation

One of the most studied themes is the KAP of adolescent girls and women regarding menstruation. In Pakistan, Shah et al. (2023) conducted a cross-sectional survey in rural Gilgit and found that over half the participants had poor knowledge, practices, and negative attitudes toward menstrual

hygiene. Cultural taboos and communication barriers with teachers and family members were cited as contributing factors.

In Tanzania's Kilindi District, a 2025 study by Ngilangwa et al. assessed MHM practices and identified several correlates of inadequate hygiene, such as limited access to water, absence of private latrines, and restrictions during menstruation. These findings are consistent with many prior studies in low- and middle-income countries (LMICs), which often reveal gaps in awareness and suboptimal practices (e.g. irregular changing of pads, reusing cloth without adequate cleaning, poor disposal).

In India, the study by Dasgupta & Sarkar (2008) entitled "*Menstrual hygiene: how hygienic is the adolescent girl?*" remains highly cited for its early empirical documentation of deficits in awareness, practice, and access among schoolgirls. Many subsequent studies have replicated or extended its findings across rural and urban settings in India and beyond.

These recurring patterns underscore that knowledge alone is insufficient: the translation of awareness into hygienic practice is constrained by material, environmental, and normative factors.

Material Access, Infrastructure, and WASH Challenges

Access to appropriate menstrual materials and WASH (water, sanitation, hygiene) infrastructure is a central structural barrier in the literature. Sumpter & Torondel (2013) performed a foundational systematic review linking poor menstrual hygiene with negative health and social outcomes, highlighting the pervasive lack of clean water, safe disposal systems, and private sanitation as constraints.

Woo et al. (2019) conducted a systematic review specifically on sanitary pad use and female health outcomes, documenting that inadequate product quality or reuse of pads/cloths is associated with discomfort, infections, and diminished quality of life. In Gujarat, India, tribal adolescent girls experienced health improvements when introduced to better menstrual hygiene practices in intervention projects (e.g. provision of better materials and education) (Woo et al., 2019).

A case in Uganda examined low-cost sanitary pads in school settings—Crofts & Fisher (2012) studied the feasibility and acceptability of reusable pads among schoolgirls, showing that such alternatives can partially mitigate supply constraints but must be accompanied by WASH support (e.g. washing stations, sanitary disposal) to be effective.

Mahon & Fernandes (2010) argued that menstrual hygiene is often neglected within WASH programs in South Asia—despite the clear overlap—leading to gaps in integrated planning.

Thus, material access and physical infrastructure are necessary, but not sufficient, conditions for effective menstrual hygiene.

Health Outcomes & Biological Risks

A significant strand of literature examines how inadequate menstrual hygiene may contribute to health risks. Sood et al.'s systematic review (2022) collated evidence linking poor menstrual hygiene to increased risks of urinary tract infections (UTIs), reproductive tract infections (RTIs), and genital discomfort, but also cautions that rigorous causal evidence remains limited.

Anand, Singh, & Unisa (2015) in India reported an association between poor menstrual hygiene practices (e.g. reuse of cloth without proper washing) and abnormal vaginal discharge and reproductive tract infections among women. Other studies hint at potential links with cervical

cancer risk, though these are more speculative or indirect (for example, via chronic infection pathways) (Brinton et al. as referenced in cited lists).

Still, many authors caution that empirical causality is difficult to establish because of confounding factors (e.g., socioeconomic status, general hygiene, access to healthcare) and lack of longitudinal intervention trials (Sood et al., 2022).

Hence, while the biological plausibility is plausible, more rigorous studies are needed to confirm the strength and mechanisms of specific health risks linked to menstrual hygiene practices.

Socio-cultural Norms, Stigma, and Gender Dimensions

The influence of socio-cultural norms and stigma is a core theme shaping how menstruation is experienced and managed. Many studies document myths, taboos, and restrictions (e.g., exclusion from the kitchen or temple, avoidance of bathing, silence around menstruation) that exacerbate secrecy and poor hygiene (Mahom & Fernandes, 2010; Sood et al., 2022; Pagore & Chaudhari, 2021).

Johnston-Robledo & Chrisler's work "*The Menstrual Mark*" (cited in turn0search1) conceptualizes menstruation as a site of social stigma—the "mark" that signals difference, shame, or impurity—reinforcing silence and self-monitoring in women.

McMahon et al. (2011), in a qualitative study in Kenya, found that girls often internalize shame, fear of leakage, and worry about being discovered, which affect their school attendance and emotional well-being:

"The girl with her period is the one to hang her head."

These socio-cultural forces not only influence practice but also suppress dialogue and inhibit efforts to design sensitive interventions (Hennegan et al., 2021; Sood et al., 2022).

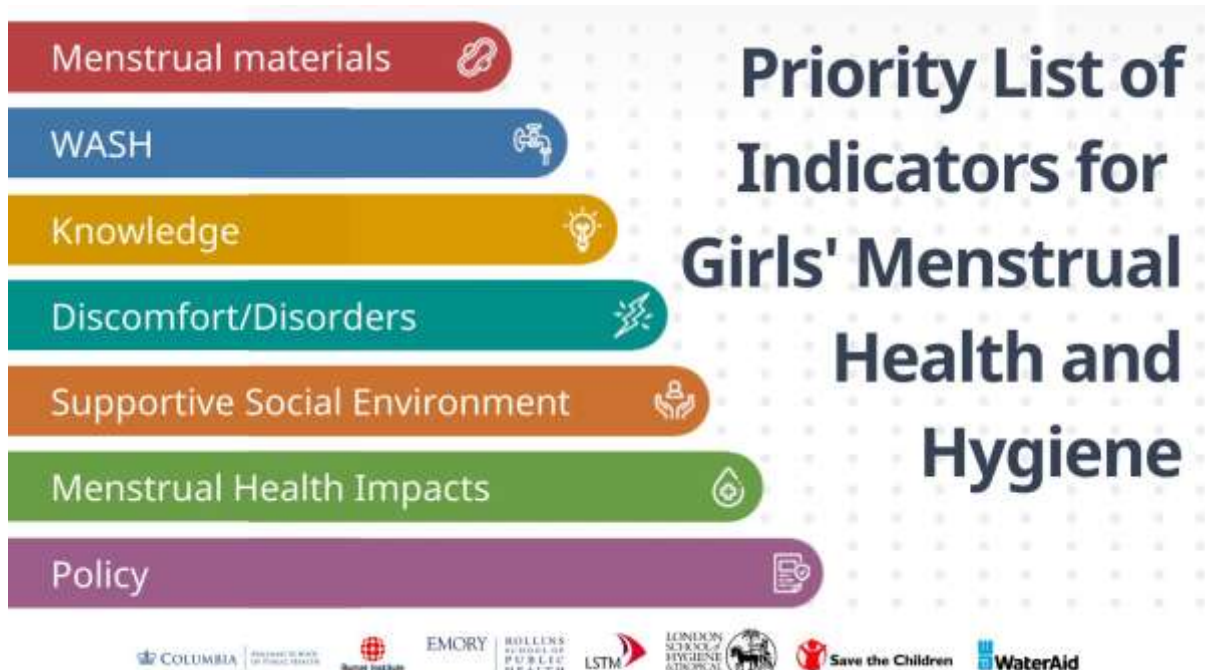
Moreover, gender inequities shape power dynamics: often, men and boys are excluded from menstrual discussions, so stigma remains unchallenged. Some authors (e.g. in the rights-based paradigm) emphasize the need for inclusive programming that engages boys, men, community leaders, and policymakers.

Intervention Strategies & Policy Responses

Given the multidimensional challenges, interventions in the literature are correspondingly varied—ranging from education and awareness campaigns to distribution schemes, infrastructure upgrades, and policy advocacy.

A review by Sood et al. (2022) highlights that many existing programs focus on product supply (e.g., free or subsidized pads) but often neglect sustainability, behavioral change, and maintenance of infrastructure.

In India, government-led schemes like the Menstrual Hygiene Scheme (MHS) distribute subsidized sanitary napkins, but evaluations suggest variable reach and uptake, especially in rural or marginalized communities.



In terms of educational interventions, Pagore & Chaudhari (2021) discuss how classroom-based menstrual health education, peer-led training, and community workshops have shown promise in increasing knowledge and shifting attitudes.

In the realm of product innovation, there is increasing interest in sustainable menstrual products. Eco Femme, a women-led social enterprise in India, produces reusable cloth pads and integrates education with distribution, aiming for ecological sustainability, affordability, and literacy in menstrual practices.

In addition, several technological and smart innovations have begun to emerge. For example, the MIMA (Multifunctional IoT Integrated Menstrual Aid) project aims to integrate heating, anti-odor, leakproof features, and connectivity into intimate wear to enhance comfort during menstruation (Kumar et al., 2022). Such innovations represent an emerging frontier where menstrual health meets digital health.

From a policy lens, Hennegan et al. (2021) underscore the need for mainstreaming menstrual health into SRH (sexual and reproductive health) policies, education curricula, WASH programs, and national development agendas. The integration of menstrual health indicators into national monitoring systems (e.g. via JMP) is a step toward accountability, although many countries lag in data collection, indicator standardization, and budgetary commitments.

Gaps, Limitations, and Future Directions

Despite substantive advances, the literature has notable gaps and limitations. First, much of the evidence is cross-sectional and descriptive; randomized controlled trials or longitudinal studies examining the effect of interventions are relatively rare (Alekhya et al., 2023). Sood et al. (2022) similarly point out that causal attribution is weak due to confounding and limited intervention studies.

Second, many studies focus on school-going adolescents, leaving out out-of-school girls, working women, those in humanitarian settings, or marginalized/disadvantaged populations (e.g., persons with disabilities) (Sood et al., 2022; Hennegan et al., 2021).

Third, there is a relative paucity of contextually adapted, scalable, and sustainable interventions. While many small projects report short-term gains, fewer studies examine long-term adoption, institutionalization, cost-effectiveness, or scalability in different sociocultural settings (Hennegan et al., 2021; Sood et al., 2022).

Fourth, monitoring and evaluation frameworks remain underdeveloped: standardized indicators, consistent measurement of outcomes (especially non-biomedical ones, like dignity, social inclusion, psychosocial well-being) are yet to be universally adopted. Hennegan et al. (2021) call for harmonized metrics across health, education, WASH, and gender sectors.

Fifth, the role of men, boys, and broader community structures in enabling or resisting change remains underexplored. Many intervention studies focus on girls alone, rather than engaging the broader social ecosystem.

Sixth, emerging technologies and innovations (e.g. digital tracking, IoT-aided menstrual products) are promising but under-researched in low-resource contexts; issues of affordability, acceptability, maintenance, and equity require deeper investigation (e.g., MIMA).

Finally, intersectional perspectives (e.g. rural/urban, socioeconomic, disability, indigenous status) are not yet adequately represented. More research is needed to understand how intersecting axes of marginalization shape menstrual experiences.

Key Themes Mapped to Research Questions

From this review, several recurring themes emerge that can inform your own research design:

- The persistent knowledge–practice gap: awareness does not always translate into safe behavior due to structural and normative constraints.
- The central importance of WASH infrastructure, privacy, and disposal mechanisms as enabling factors for good menstrual hygiene.
- The complex interplay of cultural norms, stigma, and silence shaping how menstruation is internalized and managed.
- The nascent but growing space for innovation and technology, which must be adapted to local contexts.
- The need for longitudinal, intervention, and mixed-method research to move beyond description toward evidence-based strategies.
- The value of rights-based frameworks in positioning menstrual health as integral to gender equality, dignity, and development.

Methodology

The present study is based entirely on **secondary research**, drawing upon existing academic literature, institutional reports, and global data sources to analyze various dimensions of menstrual health and hygiene. The methodological approach adopted for this research is **descriptive and analytical**, aiming to synthesize previous empirical findings, policy frameworks, and theoretical discussions related to menstrual health. Data were collected from peer-reviewed journal articles, books, government publications, and credible reports from international organizations such as the World Health Organization (WHO), United Nations Children’s Fund (UNICEF), and UNESCO.

Scholarly databases including PubMed, Scopus, Google Scholar, and JSTOR were utilized to identify relevant studies published primarily between 2008 and 2024. The selection of literature was guided by keywords such as *menstrual hygiene management (MHM)*, *menstrual health*, *period poverty*, *cultural taboos*, *sanitation and hygiene*, and *gender and menstruation*. The inclusion criteria focused on studies that addressed the social, economic, cultural, and health-related aspects of menstruation in developing countries, with particular emphasis on South Asia and sub-Saharan Africa. Articles lacking methodological rigor or relevance to the research objectives were excluded to maintain quality and focus.

The collected materials were systematically reviewed and analyzed thematically to identify major patterns, challenges, and emerging trends in menstrual health management. Thematic analysis was used to group the findings into categories such as knowledge and awareness, hygiene practices, cultural perceptions, health outcomes, economic barriers, and policy interventions. A comparative perspective was maintained throughout the analysis to highlight regional variations and global consistencies. The study also critically examined policy documents and program evaluations to assess the effectiveness of governmental and non-governmental initiatives in addressing menstrual health challenges. By relying solely on secondary data, this research minimizes bias and enables a broader understanding of menstrual health issues across different cultural and socioeconomic contexts. The methodology, therefore, provides a comprehensive synthesis of existing knowledge and identifies research and policy gaps that warrant further empirical investigation in future studies.

Results and Discussion

Menstrual health and hygiene have emerged as key areas of concern within public health, gender equity, and social development studies. Existing research consistently demonstrates that menstruation is not merely a biological process but a complex socio-cultural and economic issue affecting the health, education, and dignity of millions of women and girls globally. Studies by Hennegan et al. (2021) and Sood et al. (2022) have expanded the concept of menstrual health beyond hygiene practices to encompass physical, psychological, and social well-being, highlighting that menstruation should be viewed as a matter of human rights. Despite increasing attention, the literature indicates that cultural taboos, inadequate sanitation facilities, lack of affordable menstrual products, and insufficient education continue to restrict safe and dignified menstrual management in many low- and middle-income countries.

A review of global data shows wide disparities in access to menstrual hygiene management (MHM) resources. The World Health Organization and UNICEF Joint Monitoring Programme (JMP) report that nearly 500 million people worldwide lack access to basic menstrual hygiene facilities, including clean water, privacy, and disposal options. Sumpter and Torondel (2013) emphasized that inadequate access to sanitary materials and clean water significantly increases health risks such as urinary tract infections (UTIs) and reproductive tract infections (RTIs). Similarly, Woo et al. (2019) found that the use of unhygienic absorbents or prolonged use of menstrual products leads to discomfort, irritation, and other reproductive health complications. Studies conducted in South Asia and sub-Saharan Africa further reveal that limited availability of menstrual products, particularly in rural and impoverished areas, is directly linked to poor menstrual hygiene practices and related health issues. Hennegan et al. (2016) argued that these structural inequalities create a “menstrual

inequity gap,” where socio-economic status determines the level of menstrual comfort, safety, and dignity.

Cultural and religious taboos continue to be among the strongest barriers to menstrual hygiene. Research conducted by Mahon and Fernandes (2010) and Johnston-Robledo and Chrisler (2013) reveals that menstruation is often surrounded by silence, stigma, and misconceptions, leading to restrictions on women’s participation in daily life during menstruation. These restrictions include prohibitions on entering religious spaces, cooking, or interacting freely within households, particularly in South Asian and African societies. Such beliefs perpetuate shame and secrecy, discouraging open conversations about menstrual health. McMahon et al. (2011), in their qualitative study in Kenya, described how adolescent girls internalized menstrual stigma, leading to social withdrawal and absenteeism from school. Similar findings are reported by Shah et al. (2023) in Pakistan, where myths about menstruation being impure hindered knowledge-sharing and access to sanitary facilities. Cultural silence also affects policy-making, as decision-makers—mostly men—often regard menstruation as a private or irrelevant issue rather than a public health concern.

Themes / Variables	Findings from Literature	Supporting Studies
Awareness and Knowledge	Awareness about menstruation before menarche remains limited, with 40–50% of girls lacking basic understanding. Misconceptions and stigma persist due to silence in families and schools.	Dasgupta & Sarkar (2008); Shah et al. (2023); Pagore & Chaudhari (2021)
Cultural Beliefs and Taboos	Menstruation is often considered impure, leading to restrictions on daily activities, religious participation, and social interaction. Stigma and secrecy are widespread across South Asia and Africa.	Mahon & Fernandes (2010); Johnston-Robledo & Chrisler (2013); McMahon et al. (2011)
Menstrual Hygiene Practices	Usage of sanitary pads has increased in urban areas but remains low in rural regions. Many women still use cloth or unsafe materials due to cost and availability. Hygienic disposal practices are limited.	Sumpter & Torondel (2013); Woo et al. (2019); Hennegan et al. (2021)
Health Impacts	Poor menstrual hygiene is associated with increased risk of reproductive tract and urinary infections, though causality remains under-researched.	Anand, Singh & Unisa (2015); Sood et al. (2022)
Educational Implications	Menstruation contributes significantly to school absenteeism and dropout among adolescent girls due to fear, discomfort, and lack of privacy.	UNESCO (2022); Crofts & Fisher (2012); Hennegan & Montgomery (2016)
Economic Barriers / Period Poverty	Cost of menstrual products limits accessibility for low-income women. Rural areas face severe	Hennegan et al. (2021); Shah et al. (2023); Woo et

	product scarcity, reinforcing inequalities.	al. (2019)
Sanitation and Infrastructure	Inadequate WASH (water, sanitation, hygiene) facilities constrain safe menstrual management. Lack of disposal systems and privacy remains a global challenge.	Mahon & Fernandes (2010); Sumpter & Torondel (2013)
Policy and Program Interventions	Government and NGO programs have improved access and awareness, but implementation gaps persist. Product distribution often lacks behavioral and educational components.	Sood et al. (2022); Hennegan et al. (2021); Mahon & Fernandes (2010)
Technological and Sustainable Solutions	Innovations such as reusable menstrual cups, biodegradable pads, and IoT-based aids show promise but face barriers of affordability and cultural acceptance.	Crofts & Fisher (2012); Kumar et al. (2022)
Gender and Inclusion	Menstrual health is rarely discussed with men and boys, perpetuating stigma. Inclusion of all genders in awareness initiatives is essential for long-term social change.	Johnston-Robledo & Chrisler (2013); Hennegan et al. (2021)

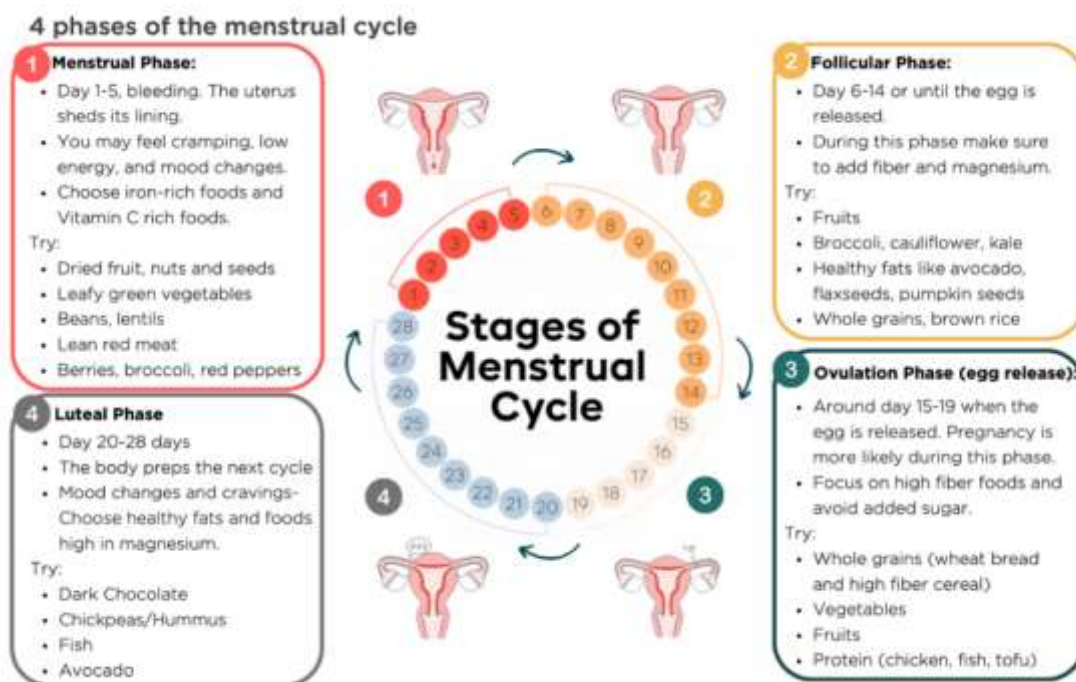
The relationship between menstrual hygiene and education has been well documented. UNESCO (2022) reports that inadequate sanitation and lack of menstrual products contribute significantly to absenteeism among schoolgirls. Studies from India, Kenya, and Uganda show that between 10 to 20 percent of school-aged girls miss classes during menstruation due to fear of staining, pain, and lack of privacy. Crofts and Fisher (2012) found that in Uganda, the introduction of low-cost reusable sanitary pads and menstrual education reduced school absenteeism by nearly half. Similarly, Hennegan and Montgomery (2016) reported that access to menstrual products and improved sanitation enhanced school participation and confidence among adolescent girls. These findings underscore that menstrual hygiene directly influences educational outcomes, confidence, and social inclusion. Beyond education, women's productivity and participation in the workforce are also affected by menstruation-related discomfort and lack of adequate facilities.

Economic constraints, often referred to as "period poverty," remain a central issue in the literature. Hennegan et al. (2021) and Shah et al. (2023) describe period poverty as the inability to afford menstrual hygiene products, compounded by the absence of supportive infrastructure. In developing regions, many women resort to using unhygienic materials such as old cloth, paper, or ash, which increase the risk of infections. Woo et al. (2019) observed that affordability challenges are often coupled with limited product availability in rural areas. Government and NGO initiatives, such as India's Menstrual Hygiene Scheme (MHS) and the global "Menstrual Hygiene Day" campaigns, aim to address these disparities. However, as Sood et al. (2022) note, many such programs prioritize product distribution over long-term education, awareness, and behavioral change. The lack of gender-sensitive infrastructure, especially disposal systems and private toilets, continues to limit progress even in areas where awareness has improved.

Health outcomes associated with poor menstrual hygiene are a recurrent focus in the literature. Anand, Singh, and Unisa (2015) linked unhygienic menstrual practices to increased cases of RTIs

among Indian women, while Sood et al. (2022) compiled evidence showing that poor menstrual hygiene correlates with a range of infections, though causality is difficult to confirm due to limited longitudinal research. Studies emphasize that menstrual hygiene is closely intertwined with overall reproductive health and that neglecting menstrual management can have long-term implications for fertility and well-being. Hennegan et al. (2016) and Woo et al. (2019) advocate for the integration of menstrual health into reproductive health and public sanitation policies to reduce health inequalities.

Socioeconomic and infrastructural determinants of menstrual health are also well documented. Dasgupta and Sarkar (2008) found that awareness and hygiene practices were significantly better among urban and educated populations than among rural communities. Similarly, studies in East Africa and South Asia demonstrate that education and income levels are key predictors of menstrual management behavior. Access to water, sanitation, and disposal facilities directly influences hygiene practices. Inadequate WASH infrastructure often forces women to change or clean menstrual materials in unsafe or unhygienic conditions, contributing to both physical and psychological stress. Mahon and Fernandes (2010) highlighted that menstrual hygiene management is often excluded from WASH programs despite being closely related, and they call for integrated approaches that combine hygiene infrastructure with education and empowerment initiatives.



In recent years, technological and social innovations have been explored to improve menstrual hygiene outcomes. The introduction of reusable menstrual cups, biodegradable pads, and locally produced low-cost alternatives represents a move toward sustainable solutions. Studies such as Crofts and Fisher (2012) have demonstrated that reusable products are effective and acceptable when paired with proper education on use and maintenance. Kumar et al. (2022) discussed emerging innovations such as the MIMA (Multifunctional IoT Integrated Menstrual Aid) project, which combines comfort, leak protection, and data tracking to enhance menstrual experiences. Nonetheless, scholars warn that technological interventions must be adapted to socio-cultural

contexts, as product adoption is influenced by community norms, privacy concerns, and affordability (Hennegan et al., 2021).

Policy discussions on menstrual health have grown substantially in the last decade. Many governments now recognize menstrual health as a public policy priority. For instance, India's Menstrual Hygiene Scheme and Kenya's free pad distribution programs represent significant progress in addressing menstrual equity. However, as Sood et al. (2022) point out, implementation remains uneven, with gaps in monitoring, accountability, and sustainability. The United Nations Sustainable Development Goals (SDGs)—particularly Goals 3, 4, 5, and 6—explicitly link menstrual health to good health, education, gender equality, and sanitation. Hennegan et al. (2021) argue that menstrual health should be included in global and national monitoring frameworks to ensure data-driven policy responses. Integrating menstrual health into education systems, workplace policies, and healthcare programs can help dismantle stigma and promote dignity for all menstruating individuals.

The reviewed literature demonstrates that menstrual health and hygiene remain multidimensional issues shaped by intersecting biological, cultural, economic, and policy factors. Global research underscores that addressing menstrual health requires a holistic and intersectional approach—one that ensures access to products, education, sanitation, and social acceptance. The reviewed studies collectively affirm that improving menstrual health is not only a matter of hygiene but also a pathway toward gender equality, empowerment, and inclusive social development.

Conclusion

The present study concludes that menstrual health and hygiene are multidimensional issues that extend far beyond biological and sanitary concerns, encompassing social, cultural, economic, and policy dimensions. The review of existing literature highlights that while menstruation is a natural physiological process, it continues to be burdened by stigma, misconceptions, and systemic neglect in many parts of the world. Cultural taboos and societal silence perpetuate a cycle of shame and misinformation, preventing open dialogue and effective education about menstrual health. Economic inequalities and inadequate sanitation infrastructure further exacerbate the challenges, leading to what researchers describe as “period poverty,” where access to hygienic products and private sanitation facilities remains limited for millions of women and girls. The lack of awareness, compounded by poor access to resources, continues to jeopardize women's physical and mental well-being, contributing to school absenteeism, reduced work participation, and social exclusion. Thus, menstrual health must be recognized not merely as a women's issue but as a fundamental human rights and public health concern that affects gender equality, educational opportunities, and community development.

The findings also underscore the urgent need for integrated and sustainable interventions that address menstrual health holistically. Policymakers and development organizations should prioritize menstrual hygiene within broader frameworks of water, sanitation, health, and education. Awareness programs should challenge deep-rooted cultural stigmas and encourage inclusive discussions that involve men and boys as active allies. Affordable and sustainable menstrual products must be made accessible, particularly in low-income and rural areas, alongside improved disposal and waste management systems to prevent environmental degradation. Furthermore, schools and workplaces should be equipped with adequate sanitation facilities and privacy to ensure

that menstruation does not hinder participation or productivity. Governments, NGOs, and international agencies should coordinate efforts to monitor menstrual health indicators within national health and gender equality policies, ensuring accountability and measurable progress. Ultimately, improving menstrual health is not only about providing sanitary products—it is about empowering women and girls with dignity, knowledge, and the freedom to live without stigma. Ensuring equitable menstrual health management is a necessary step toward achieving global goals of health, education, gender equality, and sustainable development.

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