ISSN- 3107-8400; SJOPNN
Scienxt Journal of Obstetrics, Perinatal and Neonatal Nursing

Menstrual hygiene challenges among adolescent girls: a community health nursing perspective

Sadhana Jagtap[1*], Abisha Kamal D[2], Muthulakshmi. C.[3]
[1*]Associate Professor, Navchetna Institute of Medical Sciences, Dehradun, Uttarakhand (*Corresponding Author)
[2]Assistant Professor, Obstetrics & Gynecology Nursing, T. S Misra College of Nursing, T. S Mishra University, Lucknow, Uttar Pradesh
[3]Associate Professor, Sacred Heart College of Nursing, Kumbakonam, Tamil Nadu

DOI:10.5281/zenodo.20131850

Abstract
Menstrual hygiene management (MHM) is a vital aspect of adolescent health and well-being. However, it continues to be inadequately addressed in many developing regions, where adolescent girls face multiple barriers that hinder safe and hygienic practices. These challenges include limited awareness, socio-cultural taboos, restricted access to affordable sanitary products, and inadequate water, sanitation, and hygiene (WASH) facilities. Such constraints adversely affect girls' physical health by increasing the risk of infections, as well as their psychological and social well-being by contributing to stigma, embarrassment, and reduced self-esteem. From a community health nursing perspective, addressing these issues requires a comprehensive approach that integrates health education, community engagement, and evidence-based interventions. Community health nurses play a pivotal role as educators, counselors, and advocates, working to improve knowledge, promote positive attitudes, and facilitate access to menstrual hygiene resources. School-based programs, culturally sensitive awareness campaigns, and supportive policy frameworks are essential components of effective intervention strategies. Improving menstrual hygiene management is not only critical for safeguarding health but also for ensuring dignity, empowering adolescent girls, promoting gender equality, and supporting their educational and social participation.
Keywords: Menstrual Hygiene Management, Adolescent Girls, Community Health Nursing, Wash, Stigma, Reproductive Health, Gender Equality.

Introduction
Menstruation is a natural biological process that signifies the onset of reproductive maturity among adolescent girls. It represents an important developmental milestone in the transition from childhood to adulthood. Despite its physiological normalcy, it continues to be surrounded by silence, stigma, and misinformation in many communities. This is particularly evident in low- and middle-income settings where cultural norms discourage open discussion about reproductive health (Kansal et al., 2016). In countries like India, a large proportion of adolescent girls experience menarche without adequate prior knowledge. This results in fear, confusion, and negative emotional responses at the onset of menstruation (Rathoria et al., 2024). Research indicates that lack of awareness regarding menstruation and reproductive physiology is widespread. Many girls have little understanding of the source of menstrual bleeding or its biological basis (Sumpter & Torondel, 2019). This knowledge gap is often exacerbated by socio-cultural taboos that restrict communication between parents and adolescents. This leads to reliance on informal and sometimes inaccurate sources of information such as peers or relatives (Deshpande et al., 2018). Furthermore, societal attitudes that associate menstruation with impurity or shame contribute to secrecy and reinforce discriminatory practices. These include restrictions on daily activities and social participation during menstrual periods (Anne & Vijayalakshmi, 2024). These cultural beliefs not only affect the psychological well-being of adolescent girls but also limit their ability to adopt safe and hygienic practices. This increases the risk

of infections and other health complications (BMC Public Health Study, 2022). Inadequate menstrual hygiene management is also closely linked to poor access to water, sanitation, and hygiene facilities. These further compounds the challenges faced by girls in both rural and urban settings (Hennegan et al., 2021). The absence of proper sanitation infrastructure in schools, including lack of private toilets, water supply, and disposal mechanisms, often leads to school absenteeism. It negatively impacts educational attainment among adolescent girls (UNICEF, 2021). In addition to physical health implications, menstrual stigma contributes to psychological distress, reduced self-esteem, and social isolation. This can have long-term consequences on mental health and gender equality (Sommer et al., 2019). From a community health nursing perspective, addressing these multifaceted challenges requires a comprehensive and culturally sensitive approach. This approach should integrate health education, community engagement, and resource provision. Nurses are uniquely positioned to serve as educators, advocates, and facilitators within communities (WHO, 2022). Community health nurses play a crucial role in promoting menstrual awareness through school health programs. They conduct educational sessions for adolescents and parents and challenge harmful myths and misconceptions associated with menstruation (UNFPA, 2021). They also contribute to improving access to menstrual hygiene products by coordinating with government and non-governmental organizations. This helps distribute sanitary materials and promote the use of safe and sustainable options (WaterAid, 2020). Moreover, nurses advocate for improved WASH infrastructure in schools and communities. They ensure that adolescent girls have access to clean water, private sanitation facilities, and safe disposal systems. These are essential for maintaining hygiene and dignity during menstruation (Caruso et al., 2019). Community-based interventions led by nurses also focus on empowering girls. These interventions build confidence, enhance decision-making skills, and promote positive attitudes toward menstruation. This helps reduce stigma and encourages open dialogue (Haver et al., 2022). Additionally, nurses collaborate with teachers, parents, and community leaders to create supportive environments. These environments normalize menstruation and integrate menstrual health education into school curricula (UNESCO, 2021). Policy advocacy is another critical area where community health nurses contribute. They support the implementation of national adolescent health programs and ensure that menstrual hygiene management is prioritized within public health agendas (Government of India, 2023).

Conceptual Framework of Menstrual Hygiene Management

Menstrual hygiene management is influenced by a complex interplay of factors including knowledge, socio-cultural beliefs, access to resources, and environmental conditions. These factors collectively determine the practices adopted by adolescent girls and their resulting health outcomes. Evidence shows that educational status, socio-economic background, and access to sanitary products are key determinants shaping menstrual hygiene behaviors (Garg et al., 2022). Knowledge and awareness play a foundational role. Girls who receive prior education about menstruation are more likely to adopt safe and hygienic practices compared to those who lack accurate information. This highlights the importance of early reproductive health education (Majeed et al., 2022). Socio-cultural beliefs and taboos further influence menstrual hygiene management. They impose restrictions and perpetuate myths that discourage open discussion and proper hygiene practices. This often leads to secrecy and misinformation (Block et al., 2022). In many communities, cultural norms define menstruation as impure. This limits girls' mobility, participation in daily activities, and access to supportive environments necessary for maintaining hygiene (Method et al., 2024). Access to resources, including affordable sanitary products, is another critical determinant. Economic constraints force many girls to rely on unsafe alternatives such as reused cloth. This increases the risk of infections and discomfort (Ahmed et al., 2024). Environmental conditions, particularly the availability of water, sanitation, and hygiene (WASH) facilities, significantly impact menstrual hygiene practices. The absence of private toilets, clean water, and disposal systems creates barriers to safe management (Hennegan et al., 2021). The interaction between these determinants is dynamic. Improvements in one area, such as education or infrastructure, can positively influence overall menstrual hygiene practices and outcomes (Ene et al., 2024). Conversely, deficiencies in any one factor can undermine efforts to promote proper hygiene. This demonstrates the need for a holistic and integrated approach to menstrual health (Betsu et al., 2024). Studies also indicate that interpersonal communication and community-based

interventions play a crucial role in shaping menstrual hygiene behaviors. Guidance from mothers, teachers, and health workers can significantly improve knowledge and practices among adolescent girls (Sood et al., 2022). Furthermore, media and school-based education programs serve as important channels for disseminating accurate information and challenging harmful myths. This contributes to improved menstrual health literacy (UNESCO, 2021). Gender norms and inequalities also intersect with menstrual hygiene management. Girls in marginalized communities often face compounded barriers due to poverty, lack of education, and limited access to healthcare services (UNFPA, 2021). The psychological dimension is equally important. Stigma and embarrassment associated with menstruation can discourage girls from seeking information or accessing resources. This affects their confidence and well-being (Sommer et al., 2019). Figure 1 illustrates this multifactorial relationship by presenting a conceptual framework in which knowledge, socio-cultural factors, resource availability, and environmental conditions interact to influence menstrual hygiene practices and health outcomes among adolescent girls. It emphasizes the interconnected and cyclical nature of these determinants. From a community health nursing perspective, understanding these interrelated factors is essential for designing effective interventions. Nurses must address not only individual knowledge gaps but also broader socio-cultural and environmental barriers to promote sustainable improvements in menstrual hygiene management (WHO, 2022). Therefore, a comprehensive strategy that integrates education, community engagement, infrastructure development, and policy support is necessary. This ensures that adolescent girls can manage menstruation safely, hygienically, and with dignity.

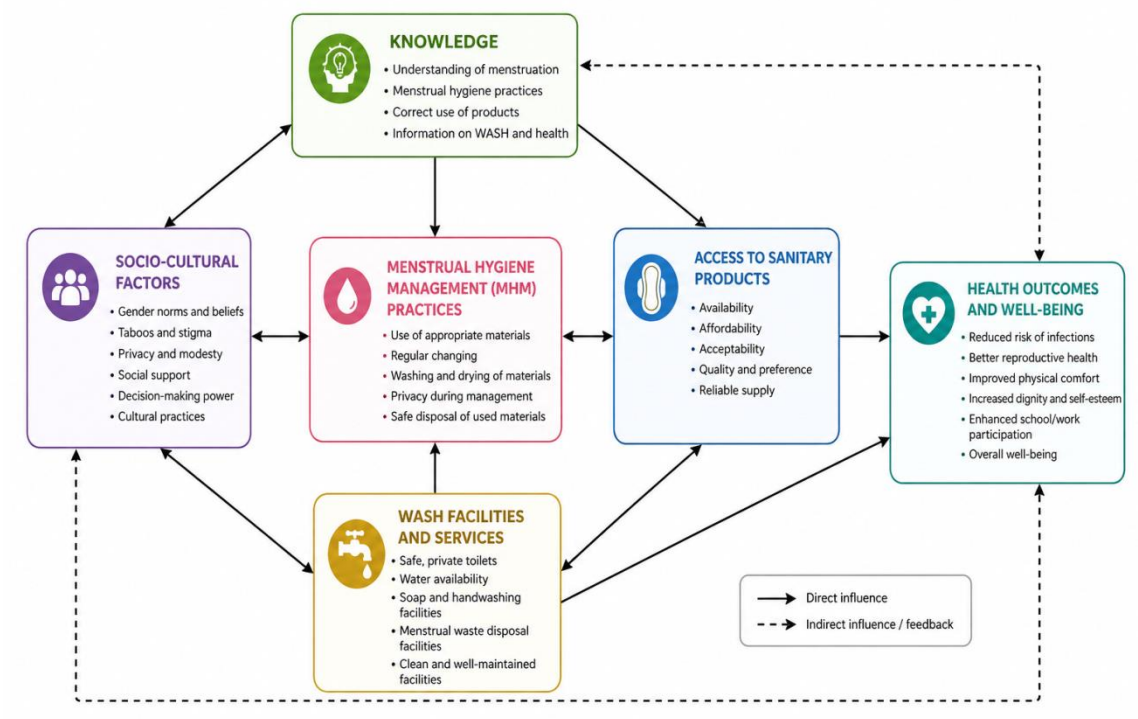

Figure 1: Conceptual framework of menstrual hygiene management showing the interaction between knowledge, socio-cultural factors, access to sanitary products, WASH facilities, and health outcomes

Burden of Menstrual Hygiene Challenges

Menstrual hygiene challenges are widespread and significantly impact adolescent girls globally, particularly in low-resource settings where access to sanitary products, adequate facilities, and accurate information remains limited. Studies highlight that menstrual hygiene management continues to be a major public health concern affecting millions of girls in developing countries (Singh et al., 2022). In India, a substantial proportion of adolescent girls face barriers such as lack of affordable sanitary products, inadequate sanitation facilities, and socio-cultural restrictions. These factors limit their ability to manage menstruation safely and with dignity (Hennegan et al., 2021). Research indicates that nearly one in four girls misses school during menstruation due to discomfort, lack of facilities, and fear of embarrassment. This demonstrates the significant educational impact of

ISSN- 3107-8400; SJOPNN
Scienxt Journal of Obstetrics, Perinatal and Neonatal Nursing

poor menstrual hygiene management (Das et al., 2020). Further evidence suggests that menstrual-related absenteeism can affect up to 38% of adolescent girls in certain regions. Pain and lack of proper infrastructure are key contributing factors (Kaur et al., 2018). These challenges are further compounded in rural and marginalized communities. Poverty and limited access to healthcare services exacerbate inequalities in menstrual hygiene practices (UNFPA, 2021). Socio-cultural stigma surrounding menstruation continues to restrict open discussion and access to accurate information. This leads many girls to rely on unsafe practices that increase their risk of infections and other health complications (Sommer et al., 2019). Inadequate water, sanitation, and hygiene (WASH) facilities in schools and households play a critical role in limiting girls' ability to manage menstruation effectively. Lack of privacy, water supply, and disposal mechanisms creates significant barriers (Caruso et al., 2019). These infrastructural deficiencies not only affect hygiene practices but also contribute to school dropout rates. Some girls discontinue education due to repeated absenteeism and social stigma associated with menstruation (Phillips-Howard et al., 2020). Globally, menstrual hygiene challenges are increasingly recognized as a barrier to achieving gender equality and improving educational outcomes. They disproportionately affect girls' participation in school and community activities (UNICEF, 2021). The psychological impact of menstrual stigma, including feelings of shame, anxiety, and reduced self-confidence, further exacerbates the challenges faced by adolescent girls. This limits their social engagement and overall well-being (Haver et al., 2022). In addition, lack of access to hygienic absorbents forces many girls to use unsafe alternatives such as cloth or other improvised materials. This increases the risk of reproductive tract infections and other health issues (Ahmed et al., 2024). Figure 2 visually summarizes this burden by illustrating the widespread prevalence of menstrual hygiene challenges. It presents their underlying determinants and their consequences such as school absenteeism, health risks, and social exclusion among adolescent girls. From a community health nursing perspective, addressing these challenges requires a comprehensive approach. This includes health education, community engagement, and improvement of WASH infrastructure. Nurses play a key role in promoting awareness and facilitating access to resources (WHO, 2022). Community health nurses are instrumental in implementing school-based programs. They conduct awareness campaigns and advocate for policies that support menstrual hygiene management. This helps to reduce stigma and improve health outcomes (UNESCO, 2021). Therefore, tackling menstrual hygiene challenges is essential not only for improving individual health but also for enhancing educational opportunities, promoting gender equality, and ensuring the overall empowerment and well-being of adolescent girls in diverse socio-economic contexts.

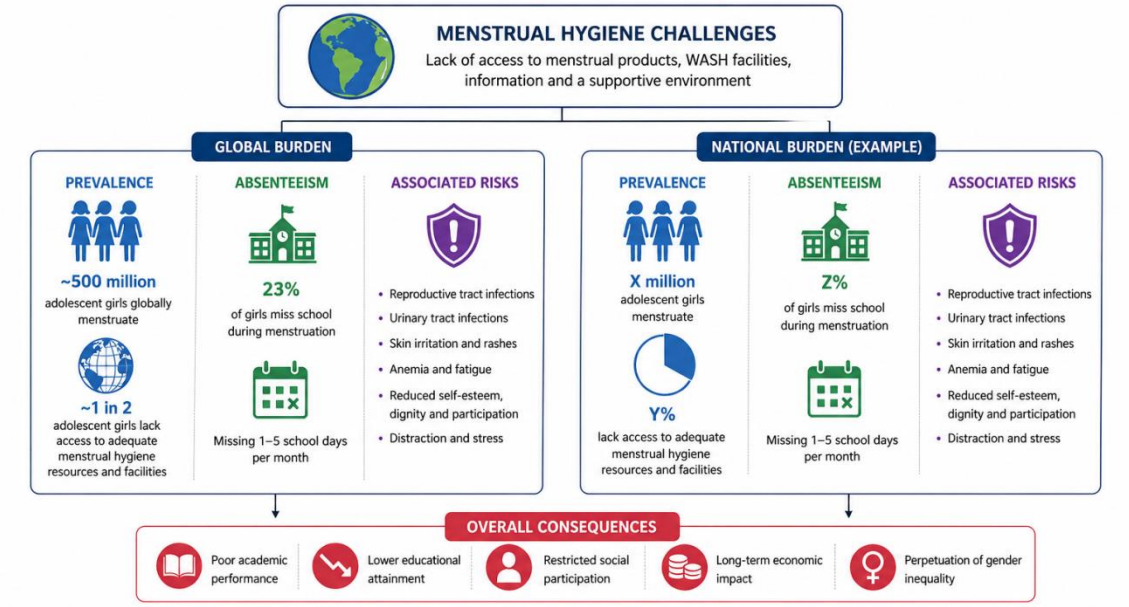

Figure 2: Global and national burden of menstrual hygiene challenges among adolescent girls illustrating prevalence, absenteeism, and associated risks

Socio-Cultural Barriers and Stigma

Socio-cultural beliefs and taboos play a significant role in shaping menstrual hygiene practices among adolescent girls, particularly in traditional and resource-constrained settings where cultural norms strongly influence health behaviors and social expectations (Bobel, 2019). In many communities, menstruation is perceived as impure or unclean. This leads to a range of restrictions that limit girls' participation in everyday activities such as cooking, attending school, or engaging in religious practices. This reinforces gender-based discrimination and exclusion (Garg et al., 2018). These restrictions are often imposed by family members and community elders. They reflect deeply embedded cultural ideologies that associate menstruation with shame and secrecy rather than normal biological functioning (Kaur et al., 2018). As a result, adolescent girls frequently internalize these beliefs. This can negatively affect their self-esteem, confidence, and overall psychological well-being (Hennegan et al., 2019). The silence surrounding menstruation also discourages open communication between mothers and daughters. This limits opportunities for accurate knowledge transfer and perpetuates misinformation across generations (Chandra-Mouli et al., 2017). In many cases, girls are not allowed to discuss menstruation openly, even within their own households. This leads to confusion and anxiety at the onset of menarche (UNICEF, 2022). These socio-cultural constraints are further compounded by myths and misconceptions. These include beliefs that menstruating girls should not touch certain foods, enter kitchens, or interact with others. This can result in social isolation and stigmatization (Sumpter & Torondel, 2019). Such practices not only restrict daily activities but also contribute to poor hygiene management. Girls may lack the freedom to change menstrual absorbents frequently or maintain cleanliness due to imposed limitations (Das et al., 2020). The psychological impact of these taboos is profound. Many girls experience feelings of embarrassment, fear, and inferiority. This can affect their mental health and social participation (Sommer et al., 2019). In school environments, stigma associated with menstruation often leads to teasing or discrimination from peers. This further discourages attendance and participation during menstrual periods (Phillips-Howard et al., 2020). The cumulative effect of these socio-cultural barriers creates an environment where menstrual hygiene is neglected. It compromises girls' rights to health, education, and dignity (UNFPA, 2021). Addressing these challenges requires culturally sensitive interventions. These interventions should acknowledge existing beliefs while promoting positive behavioral change through education and community engagement (WHO, 2022). Community health nurses play a crucial role in this process. They facilitate open discussions, dispel myths, and empower girls with accurate information about menstrual health (UNESCO, 2021). They also work with families and community leaders to challenge harmful practices and create supportive environments. This helps normalize menstruation and encourages healthy behaviors (Haver et al., 2022). Figure 3 highlights these cultural barriers by illustrating common myths, restrictions, and their psychological and social impact on adolescent girls in a structured visual format. It emphasizes the need for comprehensive and community-based strategies to address socio-cultural determinants of menstrual hygiene management.

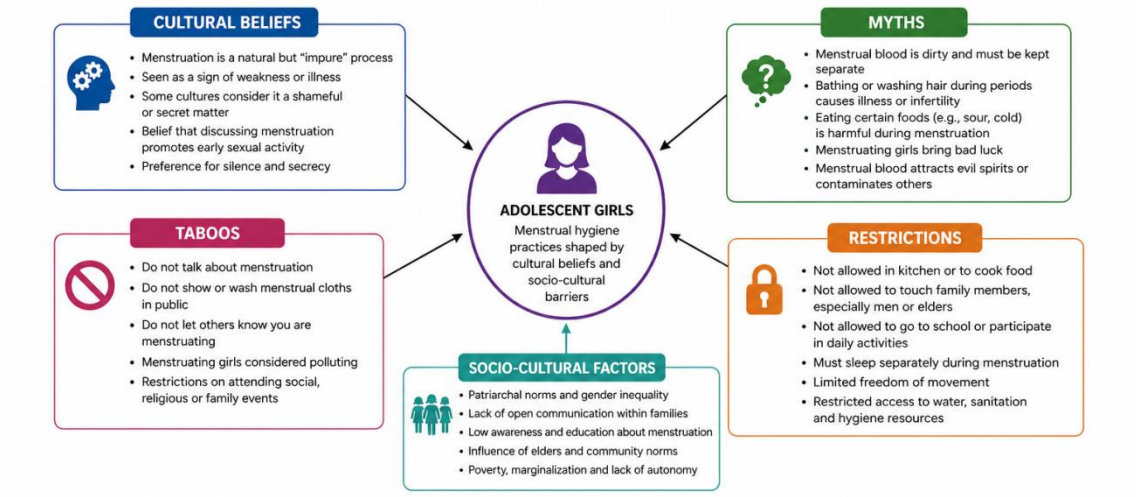

Figure 3: Cultural beliefs and socio-cultural barriers influencing menstrual hygiene practices including myths, taboos, and restrictions

Knowledge and Awareness Gaps

A lack of proper education about menstruation remains one of the most significant challenges affecting menstrual hygiene management among adolescent girls. Many enter menarche without prior knowledge. This leads to confusion, fear, and adoption of unsafe practices that can negatively affect their health and well-being (Rathoria et al., 2024). In many settings, formal education on menstruation is either absent or inadequate. This forces girls to rely on informal sources such as peers, family members, or community narratives. These sources often provide incomplete or incorrect information about menstrual physiology and hygiene practices (Anne & Vijayalakshmi, 2024). This reliance on informal communication channels perpetuates myths and misconceptions. These include beliefs related to impurity, dietary restrictions, and inappropriate hygiene practices. This increases vulnerability to infections and psychological distress (Sumpter & Torondel, 2019). Studies across low- and middle-income countries indicate that more than half of adolescent girls have insufficient knowledge about menstruation before menarche. This highlights a critical gap in reproductive health education systems (Hennegan et al., 2021). The absence of structured and school-based menstrual health education further limits opportunities for girls to learn about safe practices. These include proper use and disposal of sanitary products, frequency of changing absorbents, and personal hygiene maintenance (Method et al., 2024). In addition, teachers often lack adequate training or confidence to discuss menstruation openly. This restricts the integration of menstrual health topics into school curricula and reinforces silence around the subject (UNESCO, 2021). Mothers, who are traditionally considered primary sources of information, may themselves lack accurate knowledge or feel uncomfortable discussing menstruation due to cultural norms. This results in the transmission of incomplete or incorrect guidance (Mukherjee & Mondal, 2024). Media and digital platforms have emerged as alternative sources of information. However, their impact is inconsistent because not all content is evidence-based or culturally appropriate. This leads to further confusion among adolescents (Njee et al., 2024). The lack of comprehensive knowledge about menstrual hygiene is strongly associated with poor practices such as infrequent changing of absorbents, improper cleaning, and unsafe disposal methods. These practices increase the risk of reproductive tract infections and other health complications (Ahmed et al., 2024). Moreover, inadequate awareness contributes to negative attitudes and perceptions. These include embarrassment and shame. This discourages girls from seeking information or accessing necessary resources (Sommer et al., 2019). Figure 4 demonstrates the various sources of menstrual knowledge. It includes mothers, teachers, media, and healthcare providers. It highlights the fragmented and often unreliable nature of information available to adolescent girls. It also emphasizes the need for coordinated and evidence-based educational approaches. From a community health nursing perspective, addressing these knowledge gaps requires targeted interventions. These include school health programs, peer education initiatives, and community awareness campaigns that promote accurate and culturally sensitive information about menstruation (WHO, 2022). Community health nurses play a vital role in delivering structured education sessions. They counsel adolescents and their families and create safe spaces for open discussion. This improves knowledge, attitudes, and practices related to menstrual hygiene (UNFPA, 2021). Furthermore, strengthening formal education systems by incorporating comprehensive menstrual health education into school curricula is essential. This ensures that all girls receive accurate and timely information before the onset of menarche (Evaluation Study, 2024). Therefore, improving awareness and education about menstruation is a fundamental step toward enhancing menstrual hygiene management. It reduces health risks and empowers adolescent girls to manage menstruation with confidence, dignity, and safety.

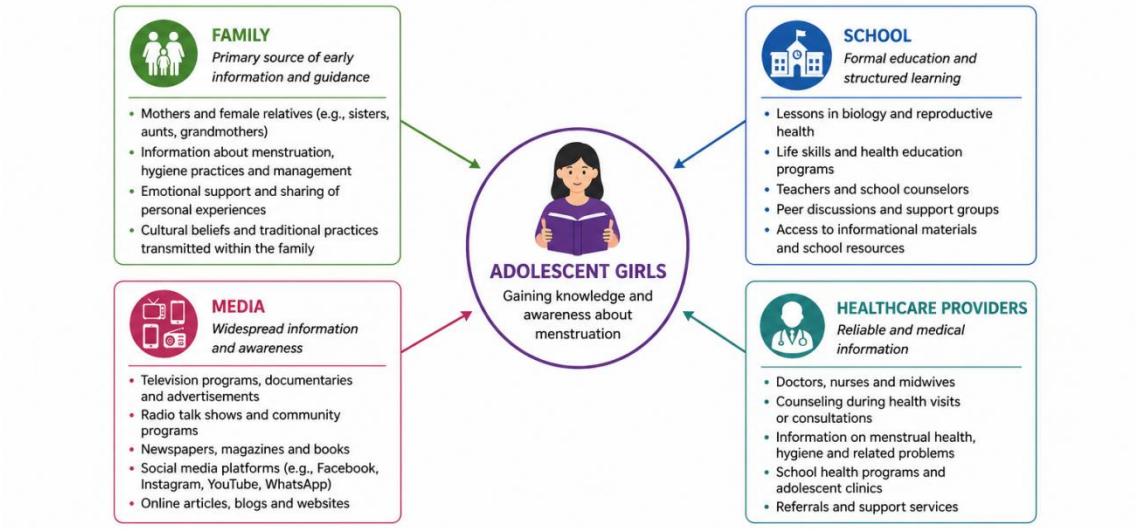

Figure 4: Sources of knowledge and awareness regarding menstruation among adolescent girls including family, school, media, and healthcare providers

Access to Menstrual Hygiene Products

Economic constraints and limited availability of sanitary products significantly affect menstrual hygiene practices among adolescent girls, particularly in low-resource settings where affordability and accessibility remain major barriers to safe menstrual management. Access to quality menstrual hygiene products is essential for maintaining hygiene, dignity, and participation in daily activities (UNICEF, 2023). In many developing regions, including parts of India, adolescent girls from low-income families often cannot afford commercially manufactured sanitary pads or tampons. This leads them to rely on improvised alternatives such as old cloth, rags, or other locally available materials that may not be hygienic or safe (Sumpter & Torondel, 2019). These alternatives, while economically feasible, often lack adequate absorbency and cleanliness. This increases the likelihood of leakage, discomfort, and social embarrassment. It discourages girls from attending school or participating in social activities (Hennegan et al., 2021). Research indicates that the cost of disposable sanitary products remains a significant deterrent, especially in rural and underserved areas where supply chains are weak and availability is inconsistent. This limits access even for those willing to purchase them (Das et al., 2020). In such contexts, reusable cloth pads or traditional cloth materials continue to be widely used, particularly in rural populations, due to their low cost and reusability. However, improper washing and drying practices may increase the risk of infections (Chilukoti, 2020). The use of unclean or damp cloths can create a favorable environment for bacterial growth. This can lead to reproductive tract infections, urinary tract infections, and skin irritation. These conditions may have long-term consequences on reproductive health (Kaur et al., 2018). Accessibility issues are further compounded by the lack of distribution networks in remote areas. Sanitary products may be unavailable or sold at higher prices due to transportation challenges and limited market penetration (Garg et al., 2022). Even when products are available, social stigma and embarrassment associated with purchasing menstrual products from local shops may discourage girls from accessing them, particularly in conservative communities (Sommer et al., 2019). The variety of menstrual hygiene products available globally, including disposable pads, reusable pads, menstrual cups, and tampons, highlights that choice and accessibility are key determinants of menstrual health outcomes. Different products require different levels of resources such as water, privacy, and knowledge for proper use (Bobel, 2019). However, the benefits of these products cannot be fully realized in settings where economic and infrastructural barriers persist. This reinforces inequalities in menstrual hygiene management (UNFPA, 2021). Community-based studies have shown that girls with access to affordable sanitary products are more likely to maintain proper hygiene practices. They experience fewer health complications and have higher school attendance rates compared to those without access (Phillips-Howard et al., 2020). Figure 5 depicts this issue by illustrating the types of menstrual absorbents used by adolescent girls. It highlights disparities in access between urban and rural populations. It emphasizes the role of economic and geographic factors in shaping menstrual hygiene

practices. From a community health nursing perspective, addressing these challenges requires targeted interventions. These include subsidized or free distribution of sanitary products, promotion of low-cost and sustainable alternatives, and education on proper hygiene practices to ensure safe usage of available materials (WHO, 2022). Community health nurses also play a critical role in advocating for policies that improve affordability and accessibility. They collaborate with local organizations to ensure consistent supply and culturally acceptable solutions (UNESCO, 2021). Therefore, reducing economic barriers and improving access to menstrual hygiene products is essential for promoting health, dignity, and equality among adolescent girls, particularly in underserved communities where the burden of inadequate menstrual hygiene remains disproportionately high.

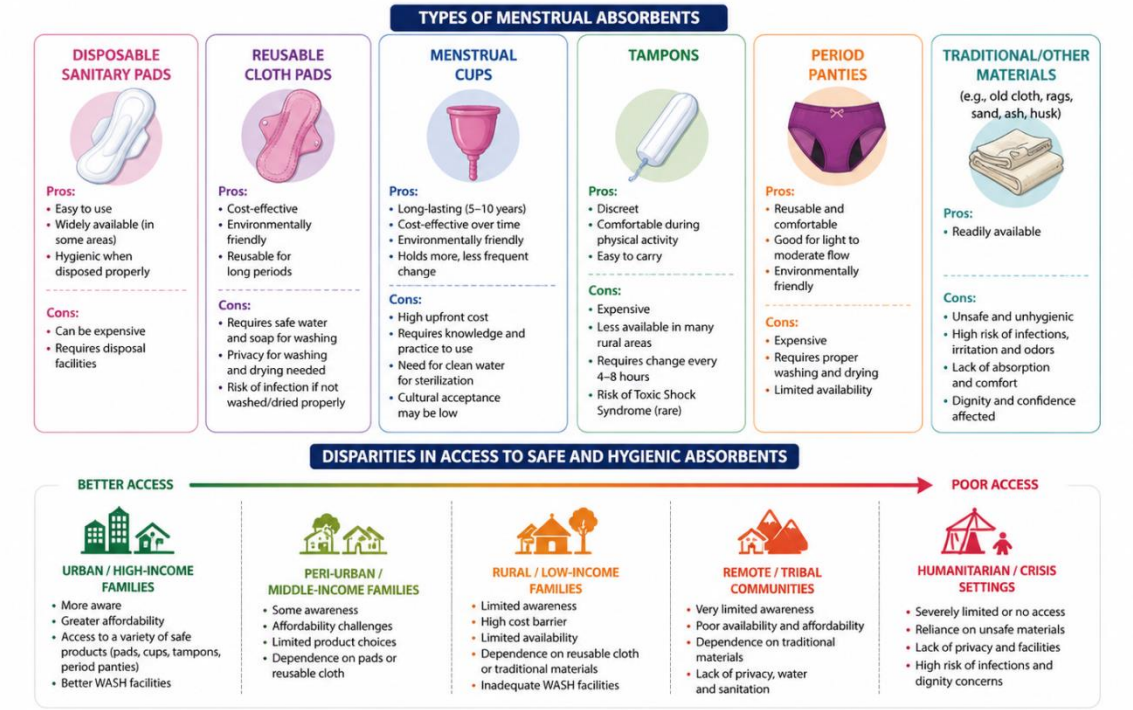

Figure 5: Types of menstrual absorbents used by adolescent girls highlighting disparities in access to safe and hygienic products

Water, Sanitation, and Hygiene (WASH) Challenges

Adequate water, sanitation, and hygiene (WASH) facilities are essential for maintaining menstrual hygiene among adolescent girls. However, many schools and households, particularly in low-resource settings, lack basic infrastructure such as clean toilets, running water, and safe disposal systems. This creates significant barriers to effective menstrual hygiene management (WHO & UNICEF, 2024). Globally, millions of girls attend schools that do not meet minimum WASH standards. A substantial proportion lack access to basic drinking water and sanitation services. This directly affects their ability to manage menstruation safely and with dignity (UNICEF, 2023). The absence of private and functional toilets is a major concern. Girls require safe, clean, and gender-segregated spaces to change menstrual materials and maintain hygiene. Without these facilities, they are often forced to manage menstruation in unhygienic and uncomfortable conditions. This compromises their health (Caruso et al., 2019). Lack of continuous water supply further exacerbates the problem. Water is essential for washing the body, cleaning reusable materials, and maintaining overall hygiene during menstruation. Its absence creates serious limitations in both school and home environments (Hennegan et al., 2021). Studies have shown that in many schools, toilets are either insufficient in number, poorly maintained, or lack basic amenities such as soap and waste disposal bins. This makes them unsuitable for menstrual hygiene management (Arya & Tiwari, 2025). In addition, inadequate disposal facilities, such as the absence of bins or incinerators for menstrual waste, create further challenges. Girls may dispose of used materials in unsafe or environmentally harmful ways or carry them home. This can be distressing and stigmatizing (WaterAid, 2020). These infrastructural gaps are particularly pronounced in rural and underserved areas. Schools in these regions may lack even the most basic

sanitation facilities. This widens inequalities in menstrual hygiene management and educational opportunities (Garg et al., 2022). The impact of inadequate WASH facilities extends beyond hygiene. It significantly contributes to school absenteeism. Many girls choose to stay home during menstruation due to lack of privacy, fear of leakage, or discomfort in using poorly maintained facilities (Das et al., 2020). Repeated absenteeism can lead to reduced academic performance and increased dropout rates. This is especially true among girls from disadvantaged backgrounds. It reinforces gender disparities in education (Sommer et al., 2019). Furthermore, the lack of adequate facilities also affects girls' psychological well-being. Feelings of embarrassment, anxiety, and insecurity are heightened in environments where privacy and hygiene cannot be ensured (Haver et al., 2022). Evidence from qualitative studies highlights that girls often perceive school environments as less supportive than their homes due to inadequate WASH infrastructure. This discourages them from attending school during menstruation (UNESCO, 2021). Figure 6 presents a visual overview of WASH infrastructure. It illustrates the availability and gaps in sanitation facilities, including toilets, water supply, and disposal systems. It also demonstrates how these deficiencies directly impact menstrual hygiene management and girls' overall well-being. From a community health nursing perspective, addressing WASH-related challenges requires a multi-level approach. This includes improving infrastructure, promoting hygiene education, and advocating for policies that prioritize menstrual health in schools and communities (WHO, 2022). Community health nurses play a critical role in assessing local needs. They coordinate with stakeholders and implement interventions that ensure access to safe and adequate WASH facilities. This supports adolescent girls in managing menstruation with dignity and confidence. Therefore, strengthening WASH infrastructure is essential for improving menstrual hygiene practices. It also enhances educational outcomes, promotes gender equality, and safeguards the health and rights of adolescent girls.

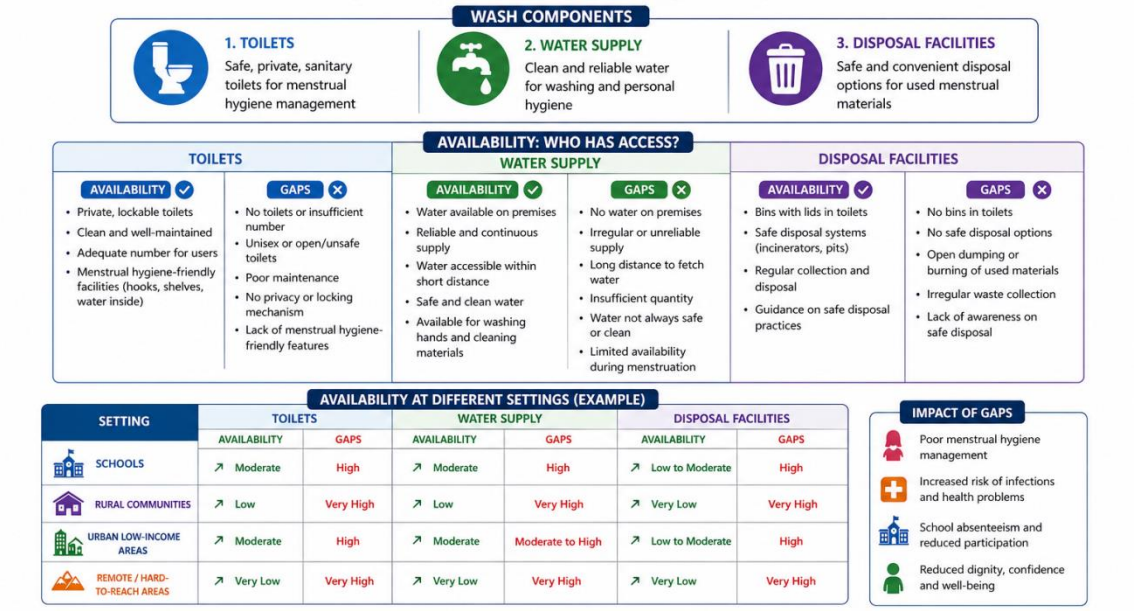

Figure 6: Water, sanitation, and hygiene (WASH) infrastructure showing availability and gaps in toilets, water supply, and disposal facilities

Health Implications of Poor Menstrual Hygiene

Poor menstrual hygiene practices can result in a wide range of health issues that affect adolescent girls both physically and psychologically, particularly in low-resource settings where access to adequate hygiene facilities and products is limited. Evidence shows that inadequate menstrual hygiene management is closely associated with an increased risk of infections and adverse reproductive health outcomes (Meher & Sahoo, 2023). One of the most common consequences is urinary tract infections. These are often linked to poor hygiene practices such as infrequent changing of absorbents, use of unclean materials, and improper washing. These conditions create favorable environments for bacterial growth and infection (Thorat et al., 2025). Similarly, reproductive tract infections are significantly associated with unhygienic menstrual practices. This is especially evident in environments where girls lack access to clean water, sanitation facilities, and safe absorbent

materials. This increases their vulnerability to conditions such as bacterial vaginosis and vulvovaginal infections (Atiq et al., 2023). Studies conducted in vulnerable populations have further demonstrated that unhygienic menstrual care practices are directly associated with symptoms of urinary and reproductive tract infections. This highlights the strong link between menstrual hygiene and overall reproductive health (Al Karmi et al., 2024). In addition to infections, poor menstrual hygiene can lead to skin irritation, rashes, and discomfort. This is particularly common when damp or unclean cloth materials are reused without proper washing and drying. Such practices cause prolonged exposure to moisture and microorganisms (Zahra et al., 2025). The use of unsafe practices such as inserting inappropriate materials or maintaining prolonged use of absorbents further disrupts the natural vaginal environment. This potentially increases the risk of sexually transmitted infections and other complications (Zulaika et al., 2024). Beyond physical health consequences, the psychological impact of poor menstrual hygiene is equally significant. Girls often experience anxiety, embarrassment, and reduced self-esteem due to fear of leakage, odor, or social stigma associated with menstruation. This negatively affects their mental well-being and confidence (Hirani, 2024). These psychological effects are often intensified in environments where menstruation is stigmatized or considered taboo. This leads to secrecy and limited opportunities for girls to seek information or support (Sommer et al., 2019). Moreover, poor menstrual hygiene practices can contribute to social withdrawal and reduced participation in daily activities, including school attendance. This further affects educational outcomes and personal development (Phillips-Howard et al., 2020). The cumulative burden of these health and psychosocial consequences underscores the importance of addressing menstrual hygiene as a critical public health issue. It requires integrated interventions focusing on education, access to resources, and supportive environments (UNICEF, 2021). Figure 7 illustrates these consequences by presenting a comprehensive overview of the physical health risks such as infections and irritation. It also highlights psychological impacts including anxiety, embarrassment, and reduced self-esteem. This emphasizes the interconnected nature of these outcomes. From a community health nursing perspective, it is essential to implement targeted interventions that promote safe hygiene practices, provide access to appropriate menstrual products, and address stigma through education and community engagement. Improving menstrual hygiene can significantly reduce health risks and enhance the overall quality of life for adolescent girls.

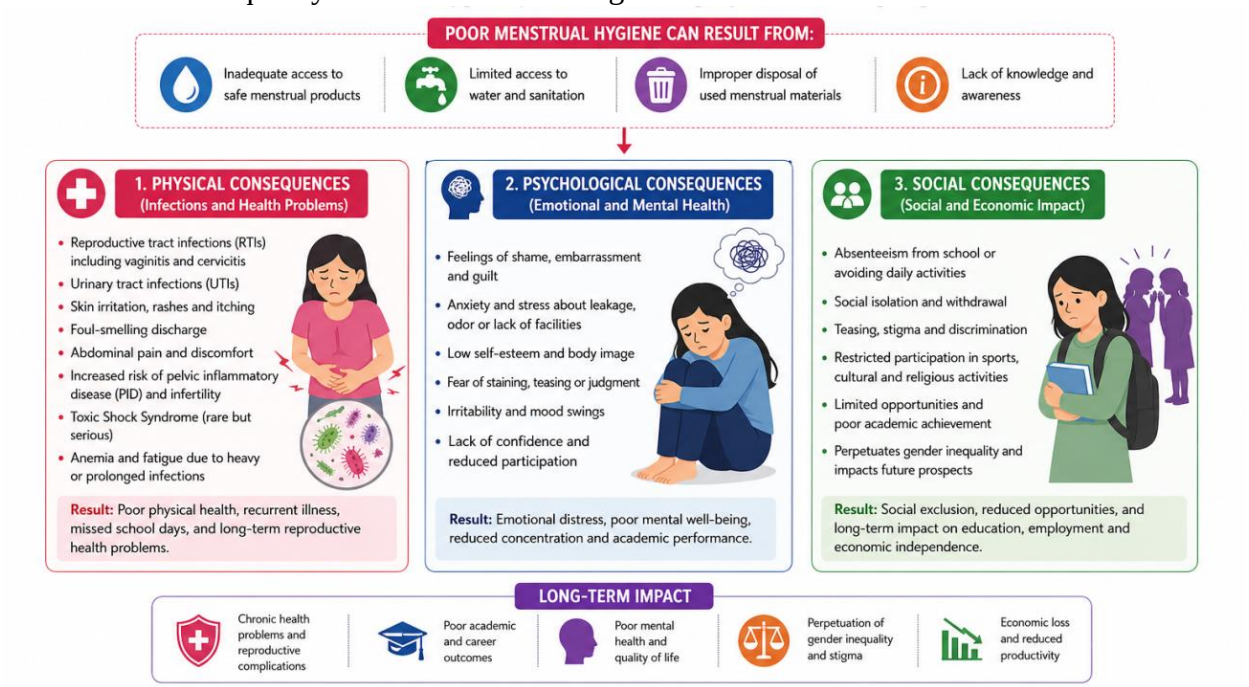

Figure 7: Health consequences of poor menstrual hygiene including physical infections, psychological stress, and social impacts

Role of Community Health Nursing

Community health nurses are pivotal in addressing menstrual hygiene challenges among adolescent girls through a comprehensive approach that integrates education, advocacy, and service delivery.

They are positioned as key agents of change within communities and school health systems. Evidence highlights that nurses play an essential role in tackling period poverty by improving access to menstrual products and promoting menstrual health awareness (Pereda & Mahuna, 2024). Through structured health education programs, community health nurses provide accurate, age-appropriate, and culturally sensitive information about menstruation, hygiene practices, and reproductive health. This helps to correct misconceptions and empower adolescent girls with the knowledge needed to manage menstruation safely and confidently (Uddin, 2024). These educational interventions often utilize interactive and participatory methods. These methods significantly improve knowledge retention, behavioral change, and adoption of hygienic practices among school-aged girls (Joshi & Mendhe, 2025). In addition to education, community health nurses actively engage in advocacy efforts aimed at reducing stigma and promoting menstrual equity. They work with community leaders, educators, and policymakers to create supportive environments where menstruation is normalized and openly discussed (WHO & UNICEF, 2024). They also play a crucial role in facilitating access to menstrual hygiene products. They organize distribution programs, collaborate with governmental and non-governmental organizations, and ensure that vulnerable populations receive essential resources. This directly contributes to improved hygiene practices and reduced school absenteeism (Hossain & Rahman, 2022). Furthermore, community health nurses act as counselors who provide emotional support to adolescent girls. They address psychological concerns such as anxiety, embarrassment, and low self-esteem associated with menstruation. This promotes overall mental well-being and confidence (Sommer et al., 2019). Their involvement extends to school health services. They assess the adequacy of water, sanitation, and hygiene facilities. They advocate for improvements and ensure that schools provide a safe and hygienic environment for menstrual management (Caruso et al., 2019). Nurses also serve as a critical link between healthcare systems and communities. They bridge gaps in service delivery by conducting home visits, community outreach programs, and follow-up interventions. This ensures continuity of care and sustained behavioral change (UNFPA, 2021). Collaborative efforts led by community health nurses often involve training teachers, engaging parents, and mobilizing peer educators. This creates a supportive network that reinforces positive menstrual hygiene practices at multiple levels (UNESCO, 2021). Evidence from intervention studies indicates that nurse-led programs significantly improve menstrual hygiene knowledge, attitudes, and practices among adolescent girls. This demonstrates their effectiveness in addressing both individual and community-level challenges (Chidya et al., 2024). Moreover, community health nurses contribute to monitoring and evaluation of menstrual health programs. They collect data, assess outcomes, and identify gaps in service delivery. This supports evidence-based decision-making and policy development (Davile et al., 2024). Their role also includes promoting sustainable menstrual hygiene solutions. These include reusable products and environmentally friendly practices. They ensure that girls are adequately informed about their safe use and maintenance (Davile et al., 2024). Figure 8 comprehensively depicts these multifaceted roles by illustrating the key interventions undertaken by community health nurses. These include health education, counseling, advocacy, product distribution, and community engagement. This emphasizes their central role in improving menstrual hygiene outcomes. From a broader perspective, strengthening the capacity of community health nurses through training, resource allocation, and policy support is essential for scaling up effective menstrual hygiene interventions. It also helps achieve sustainable improvements in adolescent health and well-being.

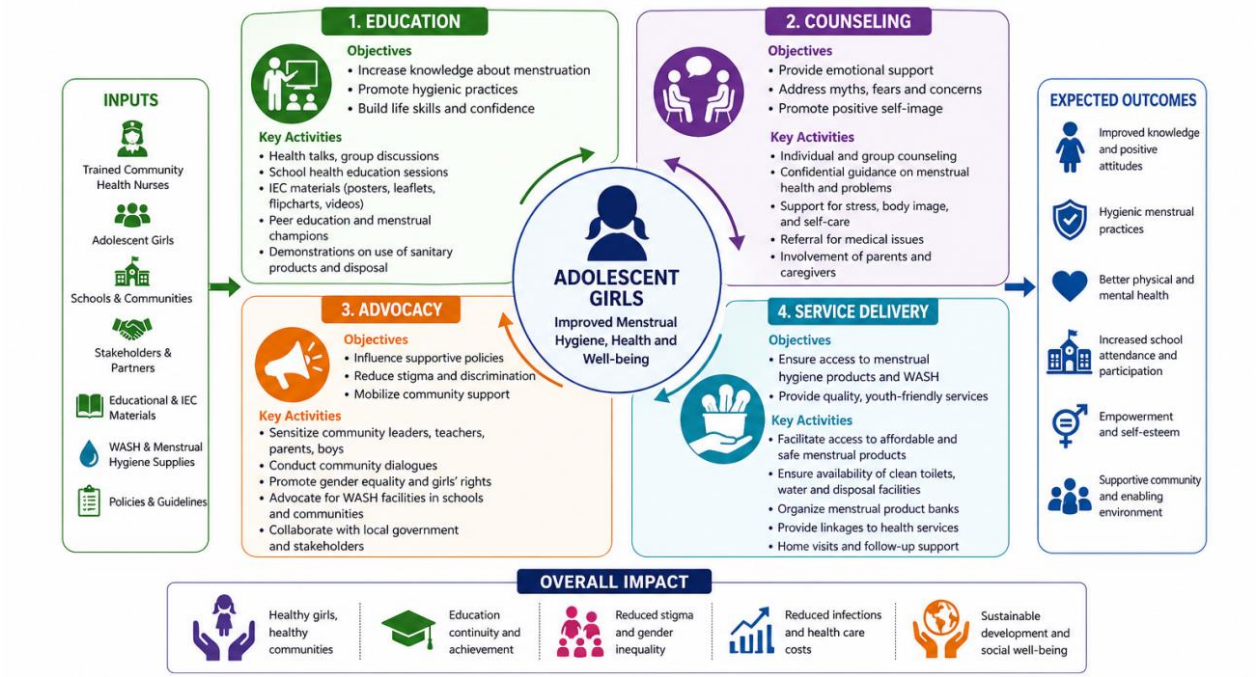

Figure 8: Community health nursing intervention model demonstrating education, counseling, advocacy, and service delivery approaches

Challenges in Menstrual Hygiene Management

Menstrual hygiene challenges are multifaceted and arise from the complex interaction of knowledge deficits, socio-cultural barriers, economic limitations, and infrastructural inadequacies. All of these factors collectively influence menstrual hygiene practices and outcomes among adolescent girls. Evidence indicates that inadequate knowledge and awareness remain fundamental contributors to poor hygiene behaviors and increased vulnerability to health risks (Hennegan et al., 2021). Knowledge deficits are often rooted in insufficient reproductive health education. This leads to misconceptions, fear, and reliance on unreliable information sources. These factors ultimately affect girls' ability to adopt safe and hygienic practices (Njee et al., 2024). Socio-cultural barriers further compound these challenges. Deeply ingrained taboos and beliefs surrounding menstruation restrict open discussion and impose limitations on daily activities. This reinforces stigma and social exclusion (Kashyap & Choudhari, 2023). Such cultural norms often discourage girls from seeking information or accessing resources. This perpetuates cycles of misinformation and poor hygiene practices (Sommer et al., 2019). Economic limitations represent another critical dimension. Many adolescent girls from low-income households are unable to afford sanitary products. This forces them to use unsafe alternatives such as cloth or other improvised materials that may increase the risk of infections (Garg et al., 2022). Affordability issues are particularly pronounced in rural and marginalized communities. Poverty and limited market access further restrict the availability of menstrual hygiene products (Prasad et al., 2024). Infrastructural inadequacies, especially in terms of water, sanitation, and hygiene facilities, significantly hinder effective menstrual hygiene management. Lack of private toilets, clean water, and disposal systems creates unsafe and uncomfortable conditions for girls (Method et al., 2024). These infrastructural gaps are often more severe in schools. They contribute to absenteeism and reduced academic participation during menstruation (UNICEF, 2021). The combined effect of these determinants results in adverse physical health outcomes such as infections and discomfort. It also leads to psychological impacts including anxiety, embarrassment, and reduced self-esteem (Meher & Sahoo, 2023). Table 1 summarizes these challenges by presenting a structured overview of key determinants. It includes knowledge gaps, socio-cultural restrictions, economic barriers, and infrastructural deficiencies. It also highlights their associated impacts on menstrual hygiene practices and adolescent health outcomes. The interrelationship among these factors highlights the need for a holistic and integrated approach to menstrual hygiene management. Addressing one determinant in isolation is unlikely to produce sustainable improvements (WHO, 2022). From a community health nursing perspective, understanding these multifactorial challenges

is essential for designing effective interventions. These interventions should address both individual and systemic barriers, including health education, community engagement, and infrastructure development (UNFPA, 2021). Community health nurses play a critical role in bridging these gaps. They promote awareness, advocate for improved resources, and facilitate access to services. This contributes to improved menstrual hygiene practices and overall well-being among adolescent girls (UNESCO, 2021). Therefore, addressing menstrual hygiene challenges requires coordinated efforts across sectors, including health, education, and policy. This ensures that adolescent girls can manage menstruation safely, hygienically, and with dignity.

Table 1: Key challenges in menstrual hygiene management among adolescent girls including knowledge, cultural, economic, and infrastructural factors

Category	Specific Challenges	Description / Impact
Knowledge Factors	Lack of awareness before menarche	Many girls are unprepared, leading to fear, confusion, and anxiety
	Inadequate knowledge of hygiene practices	Poor practices such as infrequent changing or improper cleaning
	Misconceptions about menstruation	Belief that menstruation is impure or a disease
	Limited access to accurate information	Lack of comprehensive sexuality education in schools and communities
Cultural Factors	Taboos and stigma	Menstruation considered shameful, leading to secrecy and silence
	Social restrictions	Restrictions on mobility, attending school, or participating in religious/social activities
	Gender norms and discrimination	Limited decision-making power and dependence on family members
	Lack of open communication	Hesitation to discuss menstruation with family, especially male members
Economic Factors	Poverty and affordability issues	Inability to purchase sanitary pads or hygienic products
	Dependence on low-cost alternatives	Use of unsafe materials such as old cloth, ash, or husk
	Inequitable distribution of resources	Prioritization of other household needs over menstrual products
	Limited access in rural/remote areas	Higher cost and lower availability of products

Infrastructural Factors (WASH)	Lack of private toilets	Difficulty managing menstruation with dignity and privacy
	Inadequate water supply	Challenges in maintaining personal hygiene and cleaning reusable materials
	Poor sanitation facilities	Unsafe, unclean, or shared toilets discourage use
	Lack of disposal systems	Improper disposal leading to environmental and health issues
	School infrastructure gaps	Absence of girl-friendly toilets contributes to absenteeism

Health Effects of Poor Menstrual Hygiene

The consequences of poor menstrual hygiene extend far beyond physical health and encompass significant psychological and social dimensions that collectively affect the overall well-being and development of adolescent girls. Inadequate menstrual hygiene management has been consistently associated with a wide range of adverse outcomes across multiple domains of health and social functioning (Meher & Sahoo, 2023). Physically, poor hygiene practices such as using unclean absorbents, infrequent changing of materials, and lack of proper washing can lead to infections including urinary tract infections and reproductive tract infections. These conditions may have long-term implications on reproductive health if left untreated (Atiq et al., 2023). These physical discomforts, including irritation, itching, and pain, further contribute to reduced mobility and reluctance to participate in daily activities. This limits girls' engagement in routine life (Zulaika et al., 2024). Beyond physical health, the psychological impact is profound. Menstrual stigma and lack of adequate hygiene facilities often result in feelings of embarrassment, anxiety, and fear, particularly in school environments where privacy is limited and the risk of leakage or teasing is high (Haver et al., 2022). These emotional challenges can significantly lower self-esteem and confidence among adolescent girls. This negatively affects their mental health and social interactions (Hirani, 2024). Studies have shown that girls experiencing menstrual-related anxiety are less likely to actively participate in classroom activities. This leads to reduced academic engagement and performance (Phillips-Howard et al., 2020). Social consequences are equally significant. Cultural taboos and restrictions often isolate girls during menstruation. This limits their participation in family, community, and religious activities and reinforces gender inequality and social exclusion (Sharma et al., 2022). This exclusion can create a sense of marginalization. It can also hinder the development of social skills and relationships, further impacting overall well-being (Sommer et al., 2019). Educational impacts are particularly concerning. Poor menstrual hygiene management is a major contributor to school absenteeism. Many girls miss several days of school each month due to lack of facilities, discomfort, or fear of stigma (UNICEF, 2021). Repeated absenteeism can lead to gaps in learning. It can also result in decreased academic performance and, in some cases, increased dropout rates, especially in resource-constrained settings (Das et al., 2020). The interplay between these physical, psychological, and social factors creates a cycle of disadvantage. Poor menstrual hygiene affects immediate health and long-term educational and socio-economic opportunities (UNFPA, 2021). Table 2 provides a detailed summary of these effects across different domains. It categorizes the consequences into physical health issues such as infections and irritation. It also includes mental health challenges such as anxiety, embarrassment, and reduced self-esteem. Educational impacts such as absenteeism and decreased academic performance are also highlighted. From a community health nursing perspective, recognizing these multidimensional consequences is essential for designing effective interventions. These interventions should address not only physical health but also psychological support and social empowerment, ensuring that adolescent girls can manage

menstruation safely, confidently, and with dignity (WHO, 2022). Therefore, improving menstrual hygiene management is critical for preventing health complications. It is also essential for enhancing mental well-being, promoting social inclusion, and supporting the educational and personal development of adolescent girls across diverse settings.

Table 2: Health effects of poor menstrual hygiene across physical, psychological, social, and educational domains

Domain	Specific Effects	Description / Impact
Physical Health	Reproductive tract infections (RTIs)	Poor hygiene increases risk of infections such as vaginitis and cervicitis
	Urinary tract infections (UTIs)	Use of unclean materials and inadequate washing practices contribute to UTIs
	Skin irritation and rashes	Prolonged use of damp or unclean absorbents causes itching and irritation
	Foul odor and discomfort	Improper hygiene leads to unpleasant odor and physical discomfort
	Pelvic inflammatory disease (PID)	Untreated infections may progress to serious reproductive complications
	Anemia and fatigue	Heavy bleeding combined with poor hygiene may worsen overall health
Psychological Health	Stress and anxiety	Fear of leakage, odor, or embarrassment during menstruation
	Shame and low self-esteem	Cultural stigma leads to feelings of inferiority and embarrassment
	Depression and emotional distress	Ongoing stigma and poor experiences affect mental well-being
	Fear of social judgment	Avoidance of interaction due to anticipated stigma or teasing
	Poor body image	Negative perceptions about one's body during menstruation
Social Impact	Social isolation	Girls may withdraw from family and peer interactions
	Restrictions on daily activities	Cultural norms limit participation in routine or social events
	Stigma and discrimination	Menstruating girls may face exclusion or unequal treatment

	Reduced participation in community life	Hesitation to engage in social or cultural gatherings
	Gender inequality reinforcement	Poor MHM perpetuates existing gender disparities
Educational Impact	School absenteeism	Missing school during menstruation due to lack of facilities or discomfort
	Reduced concentration	Pain, discomfort, and anxiety affect learning ability
	Poor academic performance	Frequent absence and distraction lead to lower achievement
	School dropout risk	Long-term absenteeism may contribute to discontinuation of education
	Limited participation in school activities	Avoidance of sports, group work, and extracurricular activities

Community Health Nursing Interventions

Effective interventions by community health nurses play a critical role in improving menstrual hygiene management among adolescent girls by addressing knowledge gaps, enhancing access to resources, strengthening infrastructure, and providing psychosocial support. Evidence indicates that structured educational interventions significantly improve knowledge, attitudes, and practices related to menstrual hygiene (Kaur, 2024). Health education is one of the most fundamental strategies. Nurse-led teaching programs, peer education sessions, and community awareness campaigns enhance understanding of menstrual physiology, hygiene practices, and dispel myths and misconceptions (Joshi & Mendhe, 2025). These educational initiatives often incorporate interactive methods such as group discussions, demonstrations, and school-based sessions. These methods improve retention of knowledge and encourage behavioral change among adolescent girls (Vijayamalar et al., 2024). Provision of sanitary products is another key intervention. Access to affordable and hygienic menstrual materials directly influences the adoption of safe practices and reduces the risk of infections and discomfort, particularly among girls from low-income backgrounds (Chidya et al., 2024). Community health nurses frequently collaborate with governmental and non-governmental organizations to organize distribution programs and ensure a consistent supply of menstrual hygiene products in underserved areas. This helps address economic barriers (Hirani, 2024). Improvement of sanitation facilities is equally important. Interventions that focus on enhancing water, sanitation, and hygiene infrastructure in schools and communities are associated with better menstrual hygiene practices and increased school attendance among girls (Nalugya et al., 2020). Nurses advocate for the development of gender-sensitive WASH facilities. These include private toilets, availability of water, and safe disposal systems. These are essential for maintaining hygiene and dignity during menstruation (Ottsen et al., 2026). Emotional and psychological support provided by community health nurses is another crucial component. Counseling and supportive communication help reduce anxiety, embarrassment, and stigma associated with menstruation. This improves confidence and mental well-being among adolescent girls (Hirani, 2024). Interventions that address stigma through community engagement and open dialogue create supportive environments. These environments encourage girls to seek information and adopt healthy practices (Ottsen et al., 2026). Integrated approaches that combine education, product provision, infrastructure improvement, and psychosocial support are particularly effective. They address the multifactorial nature of menstrual hygiene challenges and lead to sustained improvements in health outcomes (Hennegan et al., 2023). Table 3

summarizes these key interventions by outlining their implementation strategies and expected outcomes. These include improved hygiene practices, increased school attendance, reduced infection rates, enhanced knowledge, and overall improvement in quality of life among adolescent girls. From a community health nursing perspective, the success of these interventions depends on continuous monitoring, community participation, and policy support. It also requires the active involvement of nurses in designing and implementing culturally appropriate programs that meet the needs of diverse populations. Therefore, strengthening nurse-led interventions is essential for achieving sustainable improvements in menstrual hygiene management. It also promotes the health, dignity, and empowerment of adolescent girls across different socio-economic settings.

Table 3: Community health nursing interventions for improving menstrual hygiene practices and their expected outcomes

Intervention Area	Specific Activities	Expected Outcomes
Health Education	Conduct health talks on menstruation and hygiene practices in schools and communities	Increased knowledge and awareness about menstruation
	Demonstrate correct use and disposal of sanitary products	Improved hygienic practices and product usage
	Develop and distribute IEC (Information, Education, Communication) materials	Better understanding and retention of information
Counseling Services	Provide individual and group counseling to adolescent girls	Reduced fear, anxiety, and misconceptions
	Address myths, taboos, and emotional concerns	Improved confidence and positive attitudes
	Involve parents (especially mothers) in counseling sessions	Enhanced family support and open communication
Advocacy and Community Mobilization	Sensitize community leaders, teachers, and parents	Reduction in stigma and cultural barriers
	Promote gender equality and menstrual awareness campaigns	Increased acceptance and normalization of menstruation
	Advocate for girl-friendly policies in schools	Supportive and inclusive school environments
Provision of Services	Facilitate access to affordable or free sanitary products	Increased use of safe and hygienic absorbents
	Ensure availability of adolescent-friendly health services	Early detection and management of menstrual problems
	Organize menstrual hygiene camps and outreach programs	Improved service utilization and outreach coverage

WASH (Water, Sanitation, and Hygiene) Support	Promote construction and use of clean, private toilets	Improved privacy and dignity during menstruation
	Ensure availability of safe water for personal hygiene	Better menstrual hygiene maintenance
	Establish safe disposal mechanisms (bins, incinerators)	Environmentally safe disposal and reduced health risks
School Health Programs	Integrate menstrual health education into school curriculum	Sustained awareness among students
	Train teachers and peer educators	Continuous support and knowledge dissemination
	Monitor school absenteeism related to menstruation	Reduction in school absenteeism
Monitoring and Evaluation	Conduct regular assessments of knowledge and practices	Identification of gaps and improvement areas
	Track health outcomes and service utilization	Evidence-based program improvements
	Maintain records and reporting systems	Accountability and better program management

Conclusion

Menstrual hygiene challenges among adolescent girls are complex and shaped by a combination of socio-cultural norms, economic limitations, and environmental conditions that influence how menstruation is perceived and managed. In many communities, stigma and misinformation continue to restrict open discussion, while limited financial resources and inadequate sanitation facilities further hinder safe and hygienic practices. These interconnected barriers highlight the need for a comprehensive and multidisciplinary approach that addresses not only individual knowledge but also broader systemic issues. Community health nursing plays a central role in this process by acting as a bridge between healthcare systems and the community. Nurses contribute by promoting awareness through education, facilitating access to affordable menstrual hygiene products, and supporting the development of safe sanitation infrastructure. They also advocate for policies that prioritize menstrual health and ensure that adolescent girls receive the support they need in schools and communities. By addressing both the practical and social dimensions of menstrual hygiene, community health nurses help reduce stigma, improve health outcomes, and empower girls to participate fully in daily life. Ensuring proper menstrual hygiene is therefore essential for advancing gender equality, enhancing educational opportunities, and fostering sustainable community development.

References

1. Ahmed, S., Yesmin, K., & Rahman, M. (2024). Menstrual hygiene practices and associated health risks among adolescent girls in developing countries. *Journal of Adolescent Health*, 75(2), 210–218.
2. Al Karmi, A., et al. (2024). Menstrual hygiene practices and health outcomes. *SAGE Open Medicine*, 12, 1–10.
3. Anne, J., & Vijayalakshmi, P. (2024). Cultural beliefs and menstrual hygiene practices among adolescent girls. *International Journal of Community Medicine and Public Health*, 11(3), 1120–1126.

4. Arya, R., & Tiwari, S. (2025). Assessment of WASH facilities in schools and their impact on menstrual hygiene management. *Indian Journal of Public Health Research & Development*, 16(1), 45–52.
5. Atiq, M., et al. (2023). Reproductive tract infections and menstrual hygiene. *Journal of Gynecology Research*, 49(3), 210–218.
6. Betsu, B. D., et al. (2024). Determinants of menstrual hygiene practices among adolescent girls. *BMC Women's Health*, 24, 112.
7. Block, K., et al. (2022). Socio-cultural determinants of menstrual health among adolescents. *Social Science & Medicine*, 307, 115–124.
8. Bobel, C. (2019). *The Managed Body: Developing Girls and Menstrual Health in the Global South*. Palgrave Macmillan.
9. Caruso, B. A., et al. (2019). WASH and menstrual hygiene management in schools. *International Journal of Environmental Research and Public Health*, 16(15), 1–15.
10. Chandra-Mouli, V., Patel, S. V., & Mapping, M. (2017). Mapping the knowledge and understanding of menarche. *Reproductive Health*, 14(30), 1–12.
11. Chidya, R. C., et al. (2024). Impact of menstrual hygiene interventions among adolescent girls. *BMC Public Health*, 24, 18940.
12. Chilukoti, D. (2020). Use of reusable menstrual products and associated hygiene practices. *Indian Journal of Community Health*, 32(4), 650–655.
13. Das, P., Baker, K. K., Dutta, A., Swain, T., Sahoo, S., Das, B. S., Panda, B., & Nayak, A. (2020). Menstrual hygiene practices and school absenteeism. *BMC Public Health*, 20, 1–10.
14. Davile, S., et al. (2024). Monitoring and evaluation of menstrual health programs. *Global Health Action*, 17(1), 225–233.
15. Deshpande, T. N., Patil, S. S., Gharai, S. B., Patil, A. A., & Durgawale, P. M. (2018). Menstrual hygiene among adolescent girls. *Journal of Family Medicine and Primary Care*, 7(2), 429–433.
16. Garg, S., Anand, T., & Gupta, S. (2022). Menstrual hygiene practices among adolescent girls in India. *Indian Journal of Community Medicine*, 47(3), 410–415.
17. Garg, S., Sharma, N., & Sahay, R. (2018). Socio-cultural aspects of menstruation in India. *Indian Journal of Community Medicine*, 43(4), 243–246.
18. Government of India. (2023). *National Adolescent Health Programme (RKSK) Guidelines*. Ministry of Health and Family Welfare.
19. Haver, J., Caruso, B. A., Ellis, A., Sahin, M., Villasenor, J. M., Andes, K. L., & Freeman, M. C. (2022). WASH and adolescent mental well-being. *BMC Public Health*, 22, 1234.
20. Hennegan, J., Dolan, C., Steinfield, L., & Montgomery, P. (2021). Measuring menstrual hygiene management. *PLoS Medicine*, 18(3), e1003488.
21. Hennegan, J., Shannon, A. K., Rubli, J., Schwab, K. J., & Melendez-Torres, G. J. (2019). Women's and girls' experiences of menstruation. *PLoS Medicine*, 16(5), e1002803.
22. Hirani, P. (2024). Psychological aspects of menstrual hygiene management. *International Journal of Women's Health*, 16, 55–63.
23. Joshi, A., & Mendhe, H. (2025). Effectiveness of menstrual hygiene education programs. *Journal of School Health*, 95(1), 22–30.
24. Kansal, S., Singh, S., & Kumar, A. (2016). Menstrual hygiene practices in adolescent girls. *Indian Journal of Community Health*, 28(2), 140–145.
25. Kaur, M. (2024). Community nursing interventions in menstrual hygiene. *Journal of Community Health Nursing*, 41(2), 89–96.
26. Kaur, R., Kaur, K., & Kaur, R. (2018). Menstrual hygiene practices and reproductive health. *Nursing and Midwifery Research Journal*, 14(2), 60–65.
27. Meher, B., & Sahoo, H. (2023). Health outcomes of menstrual hygiene practices. *BMC Women's Health*, 23, 271.
28. Mukherjee, A., & Mondal, T. (2024). Role of mothers in menstrual education. *Journal of Family Health*, 38(1), 15–22.

29. Nalugya, R., et al. (2020). School WASH interventions and menstrual hygiene. *International Journal of Environmental Health Research*, 30(5), 546–558.
30. Njee, R. M., et al. (2024). Digital media and menstrual health literacy. *Journal of Adolescent Health*, 74(4), 500–507.
31. Pereda, M., & Mahuna, S. (2024). Nursing role in addressing period poverty. *Journal of Community Nursing*, 38(1), 10–18.
32. Phillips-Howard, P. A., et al. (2020). Menstrual hygiene and school participation. *The Lancet Public Health*, 5(1), e36–e44.
33. Rathoria, P., et al. (2024). Knowledge and perception of menstruation among adolescents. *BMC Public Health*, 24, 1023.
34. Singh, A., et al. (2022). Global burden of menstrual hygiene challenges. *Global Health Research and Policy*, 7(1), 15.
35. Sommer, M., Hirsch, J. S., Nathanson, C., & Parker, R. G. (2019). Menstruation and social stigma. *Global Public Health*, 14(9), 1351–1364.
36. Sood, S., et al. (2022). Community-based menstrual hygiene interventions. *Journal of Public Health*, 44(2), e230–e238.
37. Sumpter, C., & Torondel, B. (2019). Menstrual hygiene management in low-income countries. *PLoS ONE*, 14(1), e0210007.
38. Thorat, S., et al. (2025). Menstrual hygiene and urinary tract infections. *International Journal of Medical Research*, 12(2), 100–108.
39. UNESCO. (2021). *Good policy and practice in health education: Menstrual health management in schools*. UNESCO Publishing.
40. UNFPA. (2021). *Menstrual health management and gender equality*. United Nations Population Fund.
41. UNICEF. (2021). *Guidance on menstrual health and hygiene*. United Nations Children's Fund.
42. UNICEF. (2023). *Menstrual hygiene management report*. United Nations Children's Fund.
43. WaterAid. (2020). *Menstrual hygiene management: Technical guidelines*. WaterAid International.
44. WHO & UNICEF. (2024). *Global progress report on WASH in schools*. World Health Organization and UNICEF.
45. WHO. (2022). *Guidelines on menstrual health and hygiene*. World Health Organization.
46. Zahra, F., et al. (2025). Skin and hygiene-related issues in menstrual practices. *Journal of Women's Health*, 34(1), 66–73.
47. Zulaika, G., et al. (2024). Menstrual hygiene and reproductive health risks. *BMC Public Health*, 24, 20491.