



MENSTRUAL HYGIENE MANAGEMENT PRACTICES & CHALLENGES AMONG WOMEN IN WETLAND AREAS OF RIAU: A QUALITATIVE STUDY

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Abstract

Menstrual Hygiene Management (MHM) remains understudied among women living in wetland environments, despite their vulnerability to limited access to clean water and sanitation. This study aimed to explore the practices, needs, and challenges in menstrual hygiene management among reproductive-age women residing in the wetland areas of Riau, Indonesia. A qualitative phenomenological design was employed. Data were collected through semi-structured interviews with six women aged 19–42 years, and triangulated with two additional informants (a community health nurse and a participant's mother). Colaizzi's method was used for data analysis. Two major themes emerged: (1) Adaptation to environmental constraints—women utilized existing water sources (rivers, boreholes) and followed inherited traditions for menstrual hygiene, including unsafe disposal of sanitary pads; (2) Strategies to maintain reproductive health—women managed discomfort through herbal remedies, self-treatment, and informal social support. However, myths and lack of accurate knowledge persisted. Women in wetland areas manage menstruation through improvised practices shaped by environmental and socio-cultural factors. There is a pressing need for culturally sensitive reproductive health education, improved access to WASH facilities, and sustainable sanitary waste disposal systems

Keywords: *menstrual hygiene management; menstrual hygiene product; wetlands; women's health; waste disposal*

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INTRODUCTION

Menstrual Hygiene Management (MHM) remains a concern, particularly regarding education on personal hygiene during menstruation, the use of menstrual materials, and limitations in sanitation facilities and clean water access. Meeting the needs of menstrual hygiene is connected to achieving SDGs' objectives regarding women's physical and psychosocial health (SDG3), quality and inclusive education for women (SDG4), empowerment of women and girls (SDG5), health and sanitation (SDG6), and responsible consumption and production towards the environment (SDG12).

Menstrual Hygiene Management involves how one should behave to maintain personal hygiene during menstruation, encompassing knowledge, information, materials, and necessary facilities to effectively and privately manage menstruation (Tshomo et al., 2021).

The health issues that can arise from not implementing proper Menstrual Hygiene Management include reproductive tract infections, urinary tract infections, and irritation of the skin around the genital area. Vulvar itching caused by fungi, bacteria, and viruses accounts for as much as 44% due to poor menstrual hygiene practices, 30% due to allergens and feminine hygiene products, and 26% due to pathological abnormalities in the vulva (Susanti & Lutfiyati, 2020). The occurrence percentage of reproductive tract infections ranges from 35%-42%, frequently observed among teenagers, and from 27%-33% among young adults. Various sanitary items such as cloth/towels, scented or unscented disposable pads are used during menstruation. The selection of these materials is based on personal preferences, socio- cultural beliefs, economic status, and availability in the local market (Kaur et al., 2018). The majority of women, especially those living in urban areas, tend to use disposable commercial pads more frequently. However, women in rural areas often prefer cloth pads (Kaur et al., 2018; Van Eijk et al., 2016). Unfortunately, many women dispose of menstrual waste improperly. Urban women often dispose of waste through regular waste management and incineration, whereas women in rural areas tend to bury or discard waste in public spaces (Van Eijk et al., 2016). Disposal of menstrual waste is often neglected, leading to negative impacts on sanitation and the environment. Communities residing in wetland areas are more susceptible to contamination from menstrual waste. Sanitary products like infected pads might contain HIV and hepatitis viruses that can retain their infectivity in soil, surviving for up to six months underground (Kaur et al., 2018).

Menstrual hygiene behaviours is influenced by various factors including age, adolescent educational status, parents' educational background, family size, place of residence, monthly family income, lack of WASH (Water, Sanitation, and Hygiene) facilities, insufficient privacy in toilets,

and women's knowledge about menstruation (Deriba et al., 2022). Most research on women's knowledge about menstrual hygiene indicates a prevalent lack of comprehensive knowledge in this area (Alfi et al., 2022; Susanti & Lutfiyati, 2020), good knowledge but low menstrual hygiene practices (Kuhlmann et al., 2017), poor menstrual hygiene behaviour due to limited facilities (Tshomo et al., 2021).

The previous research on the portrayal of menstrual hygiene behaviours among adolescents in the city of Pekanbaru indicated that the majority demonstrated positive behaviours in terms of genital hygiene (65.1%). However, the majority showed negative behaviours concerning the use of sanitary pads (41.4%) (Alfi et al., 2022). Meanwhile, research conducted in the North Kampar District, Riau, showed that 73.2% of adolescent girls exhibited inadequate menstrual hygiene behaviours. This was attributed to factors such as poor knowledge (65.8%), positive/supportive attitudes (62.5%), limited exposure to information sources (61.7%), the role and support from teachers (72.5%), and the role and support from peers (86.7%). The level of knowledge among adolescent girls about menstrual hygiene in urban areas was 1.8% higher compared to the level in rural areas (Khatib et al., 2019).

The establishment of safe menstrual hygiene management behaviors has become an urgent matter and involves the responsibility of various parties. Most studies depict the knowledge, attitudes, and practices regarding Menstrual Hygiene Management among adolescents. Yet adult women play a vital role in shaping intergenerational menstrual practices and possess lived experiences that can inform more culturally grounded health interventions.

This study seeks to explore the practices, needs, and challenges associated with menstrual hygiene management among women living in the wetland areas of Riau. The findings aim to contribute to the development of a culturally appropriate framework for MHM interventions that address the unique realities of wetland environments.

METHODS

This study employed a qualitative research design with a descriptive phenomenological approach to explore women lived experiences of menstrual hygiene management (MHM) in wetland environments. This approach was chosen to gain a deeper understanding of the personal, social, and environmental factors that shape women's menstrual hygiene behaviors within the context of Riau's wetland communities (Cresswel, 2014).

The study was conducted in 2023 in Sri Meranti Subdistrict, Rumbai District, Pekanbaru City, Riau, Indonesia. This area is a peatland region covering 8.66 km² with a female population of 11,827 (Kukerta, 2023). The research explored menstrual hygiene management among women in

this wetland environment, in collaboration with Umban Sari Community Health Center. The study's sample comprises female participants aged 19 to 42 residing in the Sri Meranti neighborhood along the riverside of the Siak River. Participant selection for the research was conducted using purposive sampling with a maximum variation sampling method. This method begins by establishing specific criteria that differentiate participants, then selecting participants who significantly differ based on these criteria (Cresswel, 2016). This approach was chosen to increase the likelihood of varied findings, thereby obtaining a probabilistic value for the research outcomes (Afiyanti & Rachmawati, 2014). The inclusion criteria for the target population participants in this study are: (1) women of reproductive age residing in the Sri Meranti neighborhood, (2) capable of articulating their experiences clearly in either Bahasa or Melayu. The target population meeting these criteria is then selected and considered as potential research participants. Criteria for selecting informants include: 1) age, 2) ethnicity, 3) religion, 4) duration of residency in the wetlands, 5) marital status, 6) level of education, and 7) menstrual sanitary selection. The number of participants in the study takes into account achieving saturation.

In this study, the key informant is a nurse from the Meranti Sub-district Health Center. Information about potential participants is obtained through the key informant to establish a participant framework with maximal variation. The key informant also assesses the willingness of potential participants before meeting the researcher, adhering to research ethics principles. Candidates willing to engage in the study are then interviewed using a semi-structured format. The interviewer is the primary researcher experienced in qualitative research and actively consults with a supervisor specialized in qualitative research. The interviews, conducted in Bahasa Indonesia, begin with open-ended questions. Follow-up inquiries or probing are tailored to participants' responses to extract detailed and clear narratives.

Interviews are held at the participants' homes at agreed-upon times. Each interview session lasts between 60 - 90 minutes, conducted 2 to 3 times throughout the study period (Edwards & Holland, 2013). The researcher utilizes field notes to record the participants' situations and conditions during interviews, including details about their surrounding environment. A voice recorder is employed to capture the verbal conversations between the researcher and the participants, positioned between them during the interview. Upon completion of the interview, the researcher conducts member checking, confirming with the participants if there are any additional details or aspects they'd like to include in their statements. To maintain data validity, data collection also involves source triangulation by engaging the participant's mother who resides in the same household.

In total, there are 8 participants serving as research informants, including one participant's mother and a nurse acting as the key informant. The data collection process, from initiation to termination with the participants, spans approximately four months.

Interview recordings were transcribed verbatim and analyzed using Colaizzi's seven-step method, which included reading transcripts multiple times for immersion, extracting significant statements, formulating meanings, organizing formulated meanings into theme clusters, developing exhaustive descriptions, identifying the fundamental structure of the phenomenon, and validating findings with participants (Afiyanti & Rachmawati, 2014). Data analysis was supported using OpenCode 4.03 software to facilitate coding, categorization, and thematic organization.

Trustworthiness was ensured using Lincoln and Guba's criteria, including credibility through triangulation, member checking, and prolonged engagement; Dependability and Confirmability via audit trail and peer debriefing with experienced qualitative researchers; Transferability: by providing thick descriptions and using verbatim quotes to contextualize findings. The study was reported in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist(Tong et al., 2007).

Ethical approval was obtained from the Ethics Committee of the Faculty of Nursing, Universitas Riau(Approval No. 878/UN19.5.1.8/KEPK.FKp/2023). All participants were informed about the study's objectives, procedures, and their rights, including confidentiality, anonymity, and the voluntary nature of participation. Informed consent was obtained prior to data collection. All participant data were de-identified and securely stored.

RESULT AND DISCUSSION

A total of eight participants contributed to the study: six primary participants (women aged 19–42 years), one mother (aged 56 years), and a nurse (aged 45 years) serving as the key informant for triangulation purposes. Participants resided in the Sri Meranti area, along the Siak River in Riau, Indonesia. Their characteristics are detailed in Table 1. Data analysis yielded two major themes with five subthemes, reflecting how women manage menstrual hygiene in wetland settings and the strategies they adopt to maintain their reproductive health. A summary of themes and subthemes is presented in Table 2.

Theme 1: Adaptation to Environmental Constraints

Women described how they managed menstruation using the resources and knowledge

available to them, often shaped by environmental limitations and inherited community practices.

Subtheme 1.1: Managing Menstruation Using Available Facilities

Access to clean water remains limited in the wetlands. Women commonly used river water or murky well water for bathing and menstrual hygiene. River water was pumped into their homes or used directly at the riverbank.

"Here, all of us who live along the river use its water. For bathing, washing—except for drinking and cooking." (P1)

Although many homes have bathrooms, women reported that river bathing was often more practical than indoor facilities.

"This river water is drawn and pumped using a pump into a bucket in the bathroom." (T1)

Women who do not live exactly along the riverbanks rely on boreholes as their source of clean water. However, not all boreholes yield clear water. Some boreholes produce cloudy, yellowish, oily, and odorous water. Clear water from some boreholes is directed to several families or manually collected for cooking and drinking purposes.

"In the past, it was dug like a borehole, made into a well... this one's flow belongs to relatives, so two or three families use it... this well is clean, people also ask for water to drink there..." (P2)

Places used by participants for personal hygiene include the riverbank, latrines, and bathrooms. Despite nearly every house having a bathroom, using latrines and bathing directly in the river is still common. Some participants find bathing in the river during menstruation more practical than using the bathroom.

"Yeah, bathing in the river is easy, you can just clean up immediately, it's like swimming... whereas there (in the bathroom), it becomes a two-step job..." (P4)

Women consider the available hygiene facilities as an integral part of their lives while living along the riverbanks. They have grown accustomed to the challenge of limited facilities and clean water in the riverbank environment

Subtheme 1.2: Traditional Knowledge and Menstrual Norms

Menstrual hygiene practices were often passed down from mothers or learned informally through peers. Mothers played a central role in preparing daughters during menarche.

"Yeah, because coincidentally, I got it at home, so I told my mom afterward, then she immediately taught me and gave me pads... Yes, pads." (P2)

Women practice cleansing and caring for their femininity using soap for washing or using commercially available betel leaf soaps. Participants revealed that using specific commercially available feminine hygiene soaps was not beneficial, so they resorted to using regular bathing soap for cleansing.

"If not menstruating, sometimes I use it

(feminine hygiene soap) but when menstruating, I use that (regular soap) to clean." (P1)

During menstruation, women avoid certain practices believed to worsen menstrual discomfort. Women are advised against consuming ice, washing hair, combing hair, eating cucumber, or drinking coconut water. Some participants adhere to these myths due to fear of potential consequences.

"You can't drink ice, others say, 'Don't drink ice, it'll disrupt your period.'" (P6)

"Don't wash your hair, don't wash your hair because it might fall out. Yes, the hair loss increases during menstruation. They mean there's more hair fall. That's what people say." (P4).

Women manage menstrual pads during menstruation by washing cloth pads and disposing of disposable pads with or without soap, destroying the contents of disposable pads, then discarding them by burning or flushing them away.

"Change it, wash it, rub it first, while on your period when changing or waiting with other cloth pads." (P4)

"Wash that one, yes, wash it again. Wash it then hang it to dry... soak it with soap." (P3)

"Just pour water on it until there's no more residue." (P6)

Women wash menstrual pads in the river, latrines, and bathrooms. Some find it easier to wash them in the river than in the bathroom.

"Clean the disposable pad in the bathroom first, what matters is cleaning it, then just let it out with your foot, all of it, the main thing is the color, it shouldn't have any color left." (P3)

"We change it, then we wash it, the used ones we wash in the river. We don't use soap just discard it clean like that. That's it... the important thing is there's no more bloodstains, the water flows so it carries the leftover water from washing the pads..." (P1)

Subtheme 1.3: Making the Best of What They Have

Women tend to prefer disposable pads despite having tried cloth pads before. Mothers typically teach their daughters to use cloth pads made from used fabric during menarche. After experiencing menstruation several times, women adapt based on their comfort and knowledge.

"According to older people, using cloth is actually healthier, that's what they say. Rather than using, in the past, there were many trust issues about pads, they said it's not healthy, it causes cancer, people say that, but for us, it's about comfort..." (P4)

"Mostly, it's just at the beginning (cloth pads), after the first time getting a pad, after that, they told me to try using cloth, but it wasn't comfortable. Then I changed to disposable pads... maybe because the cloth wasn't specifically for 'getting' it (menstruation) so it folds or maybe it doesn't fit well, it's not as comfortable as disposable pads because disposable pads are usually thin, and they stick to the underwear, so it's comfortable."

(P2)

Women change pads around 2-3 times a day based on their needs and comfort level. The need is based on whether the menstrual blood has filled the pad or not. If there's not much menstrual blood, they won't change the pad or may not use one at all.

"It depends, if you see that it's a lot coming out." (P1)

"If there's a lot, it's more comfortable for us, if it's uncomfortable, we change it again. Sometimes there are obstacles when it suddenly comes a lot or a little. If it's little, sometimes we don't use a soft pad." (P3)

Triangulated sources with the participants' mothers confirm that they teach menstrual management to their daughters. Mothers gather information about managing menstruation from various experiences and interactions, including those with the Public Health Center. Although not in specific menstrual management education sessions, nurses provide information about personal hygiene along with family planning (contraception) services, prenatal classes, or during physical examinations.

"In the past, at the beginning, she was taught... These kids are lazy, don't want cloth pads, prefer buying pads... Girls these days are lazy. Hahaha. Hahaha... Oh my, dear. They're happier now, but there are more diseases now. Yes, life has become easier. In the past, it was healthier, now look at all the diseases." (T1, mother's triangulation)

"If it's specific, for example, communities dedicated to that, not only for family planning, mothers who are using family planning methods, or those who are pregnant, our classes, the prenatal classes, yes, they are informed." (T2, nurse's triangulation)

Theme 2: Strategies to maintain reproductive health

This theme describes women's coping strategies for dealing with menstrual discomfort and limited access to formal health education.

Subtheme 2.1: Self-Initiated Strategies to Manage Menstrual Discomfort

Complaints surrounding menstruation such as stomach cramps (dysmenorrhea), back pain, itching in the groin, or irregular cycles are also experienced by women. They strive to address these issues by enduring the pain or seeking nearby remedies. Efforts to endure the pain are made by lying down or resting until it subsides on its own. Some women are afraid to take medicine due to concerns about developing a dependency. Meanwhile, others attempt to alleviate the pain by purchasing medicine from nearby shops or pharmacies.

"Sometimes there's just this itching around the groin. It's itchy, so you just scratch it, right?" (P3)

"I don't want to (take medicine) because I'm afraid of getting dependent. Lisa knows that when you take it, it can lead to dependency, so I just hold

out." (P4)

"For a few months, sometimes there's no pain, it's like 'okay, this month is fine,' but if it's excessively painful, I often buy compounded medication from the pharmacy, like the one with 4 types." (P2)

In addition to menstrual complaints, women also face issues with vaginal discharge. One participant was once consulted by a man regarding his wife's discharge:

"When it comes to discharge, it's more uncomfortable than menstruation because it's like being wet, you know, that's why we use pantyliners... Usually, we change underwear only when we're about to take a shower... Sometimes this (discharge) lasts for about 4 days... it doesn't have any smell." (P4)

"I was asked, her husband asked me, said it made him feel disgusted, it had a reddish color, so I told her to take herbal medicine." (P1)

Women attempt to address menstruation-related complaints based on knowledge gained from their mothers or close friends in their community. They use boiled betel leaf water or packaged betel soap to address itching in the perineum and groin area.

"It's like just patting normally, like usual. But sometimes I'm told to pat with betel leaf water too, my mom told me... I don't understand, just to prevent itching, right?" (P4)

"The blood during menstruation makes our skin itchy too, so usually, I soak (in water) with boiled betel leaves." (P2)

"Pharmacy medicines, the ones for itching around the groin, work. I don't know the name my mom used. After taking it, the itching disappears." (P3)

"If it's not menstruation, then occasionally I use it. But if it's menstruation, I use that (betel soap) consistently for cleaning." (P1)

Women also rely on seasonal traditional treatments like massage or herbal remedies, consult with health centers, or buy medication from pharmacies.

"There's a treatment opened in the market, 'for persistent discharge.' People gather there, they call out based on their illness, then they step forward, it's crowded, then they get massaged, and then they drink herbal remedies." (P6)

"Oh, that one from the health center yesterday, I also talked about it, right? They said it's a normal thing, as long as we're taking medicine and the pain goes away, it's considered normal according to the health center." (P2)

Mothers of participants affirm that they usually teach their daughters to use boiled betel leaves. Betel leaves are commonly obtained from betel plants growing around their surroundings.

"There are a lot of betel leaves here, in front of the house, my mom boils them, then we use it to clean ourselves... it's natural, right? Every time after menstruation, everyone (all daughters) uses

it." (T1)

Many women are not well-informed about their own menstrual cycles. They are confused about determining whether their menstruation is regular or not. This confusion also occurs among married women who use contraception.

"In month 1, it's on the 25th, something like that, right? In month 2, it's also on the 25th." (P6)

"If it comes twice in one month, is that normal? Or could it be a disease?" (P4)

"It turns out it's not regular. So then, I was confused, like, is it because of this, or what? Test positive again, right? If it's positive, I'm still on contraception." (P1)

Women often face confusion in determining whether their reproductive health condition is normal or not, whether their methods of cleaning and perineum care are correct, or regarding their cycles and fertile periods.

"Sometimes we feel like, 'ah, when we get this, we feel like it's itching, right?' It's like, am I the only one feeling this or do other people also wonder if it's normal?" (P2)

"Are we cleaning it correctly or what?" (P1)

"I don't even know when my fertile period is..." (P6))

Subtheme 2.2: Seeking Support from Informal Networks

Women usually seek advice from their mothers or share experiences with peers to understand practices or issues related to womanhood. However, the challenge they face is that not all participant's friends are open to discussing matters concerning womanhood as it's considered a personal domain.

"I usually turn to my mother if I can't find the answer there, only then do I ask my friends." (P2)

"Not everyone dares to talk about their discomfort during menstruation. It's quite challenging. Sometimes when we ask about these things, it's really about finding friends who we feel comfortable discussing these things with; it's crucial to find suitable friends." (P2)

Information regarding women's health that remains a common question for women includes the use of sanitary pads, feminine care, understanding the menstrual cycle, complaints, and reproductive health disorders. This revolves around menstrual hygiene management and women's reproductive health.

"Usually, it's like things as simple as not changing pads throughout the day, there are people who don't change them unless they're full." (P2)

"Recently, through random videos on my phone, I've seen various types of discharge. Sometimes, if you ask, if it's yellow, it's supposed to be normal; usually, it's white, they say, but if it turns yellow, still transparent." (P4)

Women hope to receive information from reliable and trusted sources. According to them, discussions regarding womanhood should ideally occur in limited meetings involving only a few

women.

"It's not normal; if we talk about this (menstruation) with a group, it's not normal." (P4)

Nurses working in the local Health Posts around the participants' community explained that very few women come for consultation or report menstrual complaints. Married women are usually more open about discussing female discomfort compared to unmarried women. Married women tend to express their complaints through community health workers, then are directed to undergo IVA (Visual Inspection with Acetic Acid).

"We rarely have someone coming here for consultations. There aren't many reports about complaints." (T2)

"When it comes to issues like discharge, sometimes it goes through community health workers. Yes, sometimes we advise them to undergo IVA through these community workers." (T2 Nurse)

Women residing in wetland regions often face inadequate access to sanitation facilities and clean water sources. Due to economic and livelihood demands, many live along riverbanks and directly utilize river water for daily needs, including menstrual hygiene (Panghiyangani et al., 2019). Despite the existence of private bathrooms, the water source often remains river-dependent, and in some areas, latrines are still located outdoors. In Sri Meranti Subdistrict, clean water is processed from the Siak River by the Tirta Siak Water Company (PDAM) and distributed via piped systems. However, a significant portion of the population does not yet utilize this service, instead relying on artesian wells provided through governmental or private assistance (Willyam, 2019). Limited WASH (Water, Sanitation, and Hygiene) infrastructure is a critical challenge in achieving SDG targets, particularly regarding menstrual hygiene management (Deriba et al., 2022; Hussein et al., 2022; Sato et al., 2023; Talukdar et al., 2023).

The current menstrual hygiene practices among women in wetland areas remain below the standards recommended by the WHO and UNICEF Joint Monitoring Programme(The World Bank, 2022). Proper menstrual hygiene management includes regular cleaning of the genital area with soap and water, access to sanitation facilities, and safe disposal of menstrual waste. Contributing factors to poor menstrual hygiene behavior include limited knowledge about menstruation, lack of privacy, inadequate WASH facilities, demographic factors (age, education, family size), and living arrangements (Deriba et al., 2022; Umami et al., 2021).

The transmission of menstrual practices in these communities is predominantly cultural, with knowledge passed from mothers to daughters (Deriba et al., 2022). Mothers are the primary source of menstrual products, especially at menarche, playing a crucial role in shaping adolescent menstrual hygiene behavior. Additional

support from peers, educators, and healthcare workers is instrumental in reinforcing positive hygiene (Purwanto et al., 2022; Rahmawati et al., 2023).

Women commonly use either disposable sanitary pads or cloth pads. Older women often alternate between the two, while younger women prefer disposable pads after menarche. Though cloth pads are considered environmentally friendly, they are frequently non-sterile and used beyond recommended durations, leading to increased risk of urogenital infections (Banappagoudar et al., 2021). Repeated use of cloth pads can increase the risk of genital infections by twofold compared to disposable pads (Das et al., 2015)

Currently, women in wetlands predominantly option for easily accessible disposable pads from nearby stores. They express a preference for disposable pads due to ease, convenience, and variety (in terms of length, scent, and brand). The majority of women in the literature report preferring disposable pads for comfort (Choi et al., 2021) despite their higher cost (Sato et al., 2020). Product preference levels for menstrual hygiene are disposable pads (89%), cloth pads (4.5%), tampons (4.2%), and menstrual cups (1.6%) (Choi et al., 2021)

Participants mentioned changing pads according to need, waiting until they are full before replacing them. Disposable pads contain polyolefins, zinc oxide, and petrolatum in their top and back layers, which can cause rashes due to contact dermatitis of the vaginal surface. Using pads for more than 5 hours can result in rashes, itching, redness, and swelling. The warm and moist conditions in the groin area also increase bacterial growth, leading to infections (Banappagoudar et al., 2021). Chemicals in disposable pads can be absorbed through the vaginal mucosa filled with blood vessels, potentially causing reproductive disorders (Choi et al., 2021). Pad replacement should ideally occur when it is full or after a maximum of 8 hours of use (UNICEF, 2020).

The reference for disposable pads is driven by convenience and product variety (Choi et al., 2021; Sato et al., 2020). Nevertheless, improper disposal—such as discarding used pads into rivers—poses serious environmental and sanitation issues, mirroring disposal patterns in urban slums (Sato et al., 2023). Ineffective waste management of menstrual products contributes to broader ecological and health-related consequences (Elledge et al., 2018)

The promotion of environmentally sustainable menstrual products (e.g., menstrual cups or tampons) remains limited in wetland communities. Huang & Huang (2023) reported that tampon users had better physical and social quality of life scores compared to pad users, indicating the potential benefits of alternative menstrual products. Expanding awareness of menstrual product options is essential in empowering women to make

informed choices.

Women have not been utilizing healthcare facilities (Community Health Centers) to gain knowledge about menstrual practices and health. This occurs due to their cultural perspective that considers feminine topics as private and 'shameful' to discuss with others. Aside from mothers, women tend to share, inquire, and exchange experiences with other women in their environment. Women's conversations usually revolve around complaints, feminine care, and circulating myths. Discussions about menstrual health among women can enhance knowledge about menstrual hygiene (Nannaware & Kulkarni, 2019). Nevertheless, discussions regarding feminine health are usually limited to close acquaintances. Furthermore, as women mature, discussions about feminine health between mothers and daughters tend to diminish. Young girls in both rural and urban areas often grow up with limited knowledge of menstruation due to a lack of open communication with mothers and adult women (Hussein et al., 2022).

This study highlights the urgent need for comprehensive menstrual health education targeting all women, not only adolescents. Healthcare providers and community nurses must implement sustained reproductive health education that addresses not only hygiene and health aspects but also the environmental impact of menstrual waste and the cultural dynamics of riverbank communities.

This study's findings are constrained by the participant demographic, which may not represent the full spectrum of menstrual hygiene practices among all women in wetland regions. However, the patterns identified likely resonate with similar environments across different cities or countries, providing a foundation for broader public health initiatives.

CONCLUSION

Women living in wetland areas of Riau face complex challenges in managing menstrual hygiene due to environmental limitations, cultural beliefs, and limited access to accurate health information. Despite these barriers, they exhibit adaptive strategies rooted in local traditions and social support. However, many of these practices—such as improper pad disposal and delayed pad changes—pose risks to both personal and environmental health.

There is a critical need for culturally sensitive, community-based interventions that go beyond adolescent-focused education.

Health professionals, particularly community nurses, must proactively engage adult women through respectful and private dialogue, promote environmentally safe menstrual products, and improve access to WASH facilities. Interventions should integrate menstrual health into broader reproductive and environmental health frameworks to achieve sustainable outcomes.

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