LITERATURE REVIEW

THE LAST TABOO

Research on managing menstruation in the Pacific

August 2016

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LIST OF ABBREVIATIONS

CSE	Comprehensive Sexuality Education
DFAT	Australian Government Department of Foreign Affairs and Trade
IWDA	International Women's Development Agency
LGBTQI	Lesbian, Gay, Bisexual, Transgender, Queer or Questioning, and Intersex
MHM	Menstrual Hygiene Management
LMIC	Low- and Middle-Income Country
NGO	Non-government Organisation
PNG	Papua New Guinea
RTI	Reproductive Tract Infection
SRH	Sexual and Reproductive Health
STI	Sexually Transmitted Infection
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation and Hygiene

1 INTRODUCTION

There is increasing recognition that women and girls' experiences of menstruation and menstrual hygiene practices can negatively impact on their health, education and psychosocial outcomes in low and middle-income countries (LMICs).[1, 2] Managing menstruation effectively and with dignity can be especially challenging in these settings, and may result in adverse consequences such as behavioural restrictions, reduced school or work attendance, or shame and embarrassment. Research from Africa and Asia suggests that lack of adequate knowledge, materials and facilities to manage menstrual bleeding can impact negatively on girls' and women's participation in education and employment.[3-5] In the Pacific region however, there is a dearth of research regarding the determinants and impacts of menstrual hygiene management (MHM), and of effective interventions to improve this.

To address this gap, DFAT has commissioned the Burnet Institute, WaterAid Australia and the International Women's Development Agency (IWDA) to undertake research in three countries in the Pacific: Fiji, Papua New Guinea and Solomon Islands. This research will explore whether managing menstruation is a challenge for women and girls in the Pacific and whether menstruation is a barrier to education, employment of other income-generating activities. This research also aims to understand and provide evidence, analysis and advice on the relevant contextual factors that support or inhibit women's and girls' access to menstrual hygiene information, materials and facilities, including their needs, preferences and current access to appropriate menstrual hygiene materials, toilets, washing facilities and facilities for disposal of absorbent materials.

This literature review examines the determinants and impacts of MHM, and effective interventions for improving MHM globally and in the Pacific. The review also seeks to describe Australian Government programming relevant to MHM in the three research countries and to identify opportunities for MHM programming.

This report uses the term **menstrual hygiene management** (MHM) to refer to the specific hygiene and health requirements of women during menstruation, including the information, materials and facilities that girls and women need to manage menstruation. The term **menstrual health and hygiene** is also used and encompasses both MHM as well as the broader systemic factors that link menstruation with health, well-being, gender, education, equity, empowerment, and rights.

2 METHODOLOGY

We conducted a rapid, desk-based review of Pacific and global peer-reviewed and grey literature in order to:

- Identify existing knowledge on MHM, its determinants, and health, social, education and employment impacts on women and girls in the Pacific and globally
- Document best practices and lessons learned for improving MHM
- Describe relevant DFAT programming in target countries
- Identify gaps and opportunities in current policy and programs in the Pacific.

Where possible, attention is given to exploring the determinants, impacts and effective interventions related to MHM among vulnerable populations including: women and girls with a disability; menstruating LGBTQI; and, women and girls in humanitarian settings.

Relevant publications were identified through searching online databases (Pubmed and Waterlines Journal) and reference lists of identified publications. Database search terms included: menstrua*, menses, menarche, hygiene, management.

Additional grey literature was sourced from the personal collections of research team members and their organisations, and professional contacts and partners, including DFAT. Documents were included in this literature review if they met all of the following criteria:

1. Published in or after the year 2000
2. Peer reviewed or grey literature
3. Focused on MHM in low and middle-income settings or humanitarian settings.
4. Related to:
   - The determinants and impacts of MHM
   - Interventions to improve MHM
   - Gaps in MHM programming in the Pacific
   - DFAT programming in target countries.

Initial scoping of available literature identified a recent review[1], undertaken by FSG[*] with the support of the Bill and Melinda Gates Foundation (referred to here as the FSG-Gates Review). The FSG-Gates review focused on Sub-Saharan Africa and Asia and examined determinants and health impacts of MHM, the response by menstrual health actors, and programming opportunities to improve MHM. Our literature review draws heavily on the FSG-Gates review and complements it with any additional literature identified through our search strategies to develop a narrative synthesis of findings overall.

[*] FSG is a mission-driven consulting firm that aims to supporting leaders in creating large-scale, lasting social change.

3 RESULTS

3.1 Determinants of menstrual hygiene management

Information, education and attitudes to menstruation

Many girls and women worldwide lack sufficient information on menstruation and MHM, resulting in lack of preparation for menarche, poor MHM, and inadequate understanding about how to manage symptoms of menstruation such as pain. Surveys conducted among adolescent girls in diverse settings suggest that a very high proportion (ranging from 86% of girls in India to 45% in Indonesia) have no or little knowledge of menstruation when they begin menstruating.[2, 4, 6] A recent mixed-methods study of challenges and impacts of MHM in schools in Honiara, Guadalcanal Province of Solomon Islands identified inaccurate or inadequate information about menstruation as one of the major challenges faced by girls in managing menstruation at school.[7]

Many girls worldwide receive inadequate formal education on menstrual health. One study of Ethiopian girls and women showed that only 33% reported receiving MHM instruction at school.[8] Where menstrual health education is provided, it is often insufficient and fails to engage with those that influence and reinforce girls' knowledge, attitudes and behaviours such as parents, boys, teachers and health workers.[1] In Vanuatu, adolescent girls and boys participating in qualitative research into sexual and reproductive health reported that health education was mostly focused on HIV and STIs and that they lacked basic information regarding puberty.[9]

Lack of formal menstrual education is often compounded by lack of trusted and informed adults that girls feel comfortable talking to about menstruation.[1] Research indicates that many parents, health workers and teachers feel uncomfortable or ill-prepared to talk about menstruation with young women.[1, 8, 10] The perceived need to keep menstruation a secret, and the lack of adult knowledge relating to menstruation and MHM, helps to perpetuate misinformation relating to menstruation across generations and prevent girls from receiving and sharing information on how to mange menstruation hygienically and with dignity. In Solomon Islands, lack of support provided to girls during menstruation by school managers and teachers in some schools was identified as a challenge to girls managing menstruation effectively and with dignity at school.[7] Male peers also often feel even more uncomfortable talking about menstruation than adults and are therefore unable to provide information or support.[1]

Social norms surrounding menstruation can dissuade girls and women from seeking and receiving accurate information and communicating their needs during menstruation. In many settings across Asia and Africa, girls report that sexual connotations and beliefs about impurity make it difficult to talk to others about

menstruation.[11-14] A Pacific Regional Learning Event (PARLE)[*] hosted by the Civil Society Water, Sanitation and Hygiene Fund highlighted taboos and cultural challenges in discussing menstruation as a barrier to ensuring girls and women can manage their menstruation effectively and with dignity.[15] This finding was supported by the UNICEF study with adolescent school girls in Solomon Islands, which found that taboos against open discussion of menstruation result in girls feeling unprepared for menarche, promote feelings of fear and shame relating to menstruation, and contribute to girls' fear of leakage and staining of clothing at school.[7] A 2015 exploratory study by the WASH sector in Timor-Leste found that mothers and teachers believe they lack the knowledge and skills required to discuss menarche with adolescent students and daughters. This was identified as a barrier to adolescent girls accessing information prior to menarche.[16]

Lack of information means that some girls, women and their influencers are unaware of commercially available materials for MHM. For example, in rural Tanzania, only 24% of parents had ever heard of sanitary pads.[8]

Lack of information and social norms around keeping menstruation private also impact on hygienic use of reusable MHM products.[17] In Afghanistan, 80% of girls surveyed use water but no soap when cleaning re-useable menstrual pads, and 69% wash and dry their menstrual cloth in a corner or shadow, rather than in the sun, as is recommended.[2]

Behavioural norms and taboos surrounding menstruation can also influence MHM practices. All cultures have beliefs and social norms relating to menstruation. Some such beliefs and norms can be perceived as beneficial by women, for example enabling a menstruating woman to rest, to take a break from housework and manual labour during menstruation, or to spend time with other women. In the 1980s, Huaulu women of Eastern Indonesia reportedly stayed in communal menstrual huts on the outskirts of the village during their monthly menses in order to protect the village, and particularly men, from 'dangerous' menstrual blood.[18] However menstruation was reportedly not perceived by women as a negative experience. Women expressed pride in their role in controlling this dangerous substance. Furthermore, women spent time in the menstrual hut resting, telling stories, weaving and even building political support and power among other women. In other examples, however, social norms and beliefs can impact on girls' and women's ability to manage menstrual bleeding effectively and with dignity by restricting where they can go to purchase or make MHM material, whether and where they can bathe during menstruation, and whether they can use public or household facilities to change, wash and dry MHM materials. In some contexts in the Pacific, menstrual taboos and norms direct girls and women to avoid men and boys and, to avoid cooking or eating certain foods, and in some cases, to avoid washing during menstruation.[15] Such norms and taboos are likely to be understood and experienced

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[*] A forum attended by 70 participants from Fiji, Solomon Islands, Papua New Guinea, Timor-Leste and Vanuatu with the purpose of improving the effectiveness and sustainability of projects and strengthening the Pacific WASH community of practice.

differently by women and girls within a community. However any limitations on where a menstruating girl or woman can go, who she can see or how she can take care of herself may impact on her ability to manage menstruation effectively and with dignity while also participating in social, education, sexual and work life.[2]

Norms and taboos around menstruation tend to vary by religion. Christianity and Hinduism are the major religions practiced across our research countries (Fiji, Solomon Islands and PNG).[19-21] Globally, notions of purity and pollution are central to Hinduism. Bodily excretions, including those associated with menstruation and childbirth, are considered polluting. Avoiding contact with water, washing hair, and participating in religious ceremonies or visiting religious sites are common restrictions associated with menstruation for Hindu women, but tend to vary considerable depending on caste, ethnicity and geography.[2] In some Christian communities, menstruation is associated with impurity and menstruating girls or women must seclude themselves away and avoid touching people or objects to avoid making these impure also.[2]

Taboos and misconceptions about menstruation can be perpetuated by the mass media.[1] For example, mass media campaigns often reflect community expectations that menstruation should be concealed and should not be spoken about,[1] and mass media is a common source of information regarding menstruation for girls. In a study in Egypt, 92% of girls surveyed received most of their information on menstruation from mass media.[22]

Girls and women with a disability often face additional informational and attitudinal challenges to managing menstruation. A qualitative study by the London School of Hygiene and Tropical Medicine of barriers to WASH for people with disabilities in Malawi found that menstruation challenges were a source of shame, discomfort and worry for women with disabilities.[23] The study found that women with visual impairments had difficulties identifying when their menstrual bleeding had begun, women in wheelchairs experienced difficulties due to sitting all the time and women with intellectual impairments had difficult managing menstruation independently. Research by UNFPA in Kiribati, Solomon Islands and Tonga found that many girls and women with a disability have a 'significant need' for more information regarding sexual and reproductive health generally.[24] Women with a disability interviewed in this study reported receiving information about menstruation from their mother and female relatives, highlighting the need to engage these influencers in MHM education. This same research identified that many girls and women had attended primary school, underscoring the need for age-appropriate comprehensive sexuality education.[24]

People who identify as LGBTQI and who menstruate may also face additional barriers to MHM. LGBTQI menstruators[*] may be less likely to access MHM information, may

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[*] The term 'menstruators' is more inclusive of all genders who menstruate, such as non-binary people and trans men. This terminology recognises that not all people who menstruate are women (Quint 2016, reference 25).

have additional barriers to accessing commercial MHM products and less able to us public WASH facilities.[25, 26]

Access to menstrual hygiene materials

Options for managing menstrual bleeding vary globally. Many studies indicate that women and girls have a strong preference for commercial products such as disposable sanitary pads.[1] Commercial products, such as tampons and sanitary pads are widely used amongst adolescents in high income countries.[27] However in LMICs, commercial products may be less available and are often prohibitively expensive.[28] The cost of commercial products prevents many women and girls in LMICs from using commercial products consistently.[1] Some 70% of girls surveyed in a multi-country study in Ethiopia, Uganda, South-Sudan, Tanzania, and Zimbabwe, reported product affordability as the main reason for not using commercial sanitary pads.[1, 8]

A wide variety of re-usable MHM products (both commercial and home-made) are used globally. Reusable products include sanitary pads, cloths/towels, leaves, newspaper, tissue paper, sponges, sand, ashes and others.[2] In many cultures, tampon use is discouraged amongst young women due to concerns about blocking menstrual flow, misconceptions about tampon use leading to loss of virginity, lack of knowledge about the female reproductive tract, and discomfort touching their own genitalia.[27]

Girls who use re-useable MHM materials report challenges accessing clean and comfortable absorbent cloth materials and using them comfortably and hygienically. Common complaints with re-usable cloth MHM materials among girls and women are that they are often bulky, poorly absorbent, that they are prone to leakage, difficult to keep in place, and that they can cause chafing, pain or smell.[1, 5, 29] The Girls in Control Program in Ethiopia, South Sudan, Tanzania, Uganda and Zimbabwe found that affordable and appropriate MHM materials are largely unavailable and that most girls use whatever material they have at hand, including rags, cotton, sponges and goat skin.[17] Despite the challenges associated with re-usable materials, when used hygienically, homemade products provide benefits to users including availability, affordability, acceptability and may reduce environmental impacts of sending disposal products to landfill.[1]

Price and availability constraints, and lack of information, mean that commercial and/or highly absorbent homemade MHM products are not accessible to many girls and women. A study in Ethiopia found that almost 70% of girls used only underwear, pants worn under their dress or nothing at all to manage menstrual bleeding.[30] Available information suggests that commercial menstrual hygiene products are relatively widely available across the Pacific, particularly in urban and peri-urban areas, but that cost is a significant barrier.[31] Many women use cloths or natural materials.

Girls and women often lack the autonomy and decision-making power to decide how personal or household money is allocated. Women and girls, particularly in rural areas of LMICs, often have little-to-no input on how household money is spent.[1] In rural

Kenya, two thirds of users receive sanitary pads from sexual partners.[32] Strong social norms regarding which MHM materials are "correct" and "hygienic" may also dictate which materials girls and women can use during menstruation, and may contribute to strong feelings of shame when girls are unable to access these preferred products.[33]

Choice of menstrual hygiene products can also be influenced by social aspirations. For example, SNV's research on menstrual hygiene product supply chains in Tanzania and Uganda found that emotional motives carried more weight in purchasing decisions by consumers than rational motives such as pricing and quality.[34] The study found that in Uganda the brand 'Always' was positioned as an aspirational brand, meaning that it was perceived to be of high quality and perceived to be associated with higher socioeconomic status, and was the preferred brand among school girls and women.

Last-mile distribution[*] of sanitary pads remains a challenge in LMICs. Centralised production of sanitary items, safety and transportation costs are reported as key challenges to product distribution by NGOs and for-profit companies.[1] In India, decentralised production of commercial sanitary products have expanded in recent years, but low production levels limit the scale and reach of these low-cost products.[1]

Commercially available sanitary products are often of poor or inconsistent quality in LMICs. Standards are often inconsistently enforced, or may only apply to foreign imports or disposable products. For example, in Kenya, Government regulation of sanitary product quality currently only applies to disposable pads, leaving reusable MHM materials unregulated and therefore of variable quality and safety.[1]

Government taxes and import duties on MHM products contribute to higher costs of MHM products. In 2013, consumers in LMICs paid comparatively higher prices for MHM materials than those in high income countries due to high import duties.[1] Duty rates for sanitary products vary widely worldwide, with tariffs around 15% in Argentina, Croatia, Rwanda, Tanzania, and Pakistan to as high as 40% in Botswana, South Africa, and Namibia.[1] These taxes increase the price of products and make products less accessible, disproportionately affecting girls and women with lower disposable incomes.

Some people who identify as LGBTQI and who menstruate may also face additional barriers to accessing commercial MHM products. For example, LGBTQI who have masculine gender identities but also menstruate may find it difficult, embarrassing or feel ashamed purchasing MHM products.[25, 26]

Water, sanitation and hygiene facilities

Many girls and women do not have access to appropriate water, sanitation and hygiene facilities for managing menstruation, particularly in rural and disadvantaged communities and households. Globally, 748 million people lack access to improved

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[*] 'Last-mile' distribution means the distribution of a product or service from a transportation or service hub into rural or remote communities and into the home of consumers.

water sources, 2.5 million people lack access to improved sanitation, and hundreds of millions of people lack access to soap for washing.[35] During menstruation, girls and women need access to soap and water for hand washing, access to safe, private and functional latrines for changing MHM materials, and safe, private and functional water sources for washing their body. Girls and women using re-usable MHM products also need somewhere private to wash their materials with soap and water and somewhere clean to completely dry these materials hygienically in the sun, or less preferably, completely dry in the shade. Those who use disposal MHM materials need private and hygienic facilities for disposing of used MHM materials. Research shows that girls and women also prefer gender separate sanitation facilities for managing menstruation. The FSG-Gates review found that when gender-separate facilities are not available at schools, work, or in public places, many women and girls either choose to stay at home, use an isolated open space instead of using shared facilities, or choose to remain uncomfortable and not change their MHM materials at all.[1]

In the Pacific region only 30% of people have access to improved sanitation.[36] Open defecation rates are high, particularly in Kiribati (37%), Solomon Islands (18%) and PNG (12%), and rural-urban inequities in access to sanitation are high.[36] Only 52% of people in the Pacific have access to improved water sources.[36] Available information suggests that inadequate facilities for changing, washing and disposal of absorbent materials may be a barrier to good MHM in the Pacific.[31]

Studies conducted in school settings indicate that many girls do not have the facilities to manage menstruation effectively and with dignity. For example, many schools lack access to private, functional, clean and light facilities for changing MHM materials, washing hands and/or cleaning their body.[4] For those who can afford commercial, single-use MHM products, discrete and culturally appropriate waste-disposal at school continues to be problem.[4, 37] Research by UNICEF in schools in Solomon Islands indicated that inappropriate facilities are a barrier to girls managing menstruation discretely at school, as there were no bins in toilet stalls or incinerators to dispose of solid waste.[7]

Many public and private water, sanitation and hygiene facilities will not be accessible to women with physical, visual, hearing or intellectual/cognitive disabilities. A 2011 global literature review concluded that the WASH needs of women with disabilities were often overlooked, and that women with disabilities sometimes faced double or triple layers of discrimination.[38] A qualitative study in Malawi documented the range of physical barriers to WASH facilities that women with different impairments experience. It found that the physical barriers included long distance to toilets, difficulty locating latrine holes, difficulty locating soap or carrying water for handwashing.[23] Two WaterAid WASH projects in Zambia and Uganda found women with disabilities face common physical, attitudinal and intuitional barriers to accessing WASH.[39, 40] The study in Zambia found that 90% of people with disabilities in participating households had access to less water than other members of their household.[39] One study in school settings in Indonesia found that paths and doorways to school latrines were inaccessible to wheelchair users and the squat toilets were unusable for some girls with a physical disability.[4]

LGBTQI community members with masculine gender identities may also find it difficult using public WASH facilities, and finding places to change and dispose of MHM materials discretely.[25, 26]

3.2 Social, education, employment and health impacts of menstruation and menstrual hygiene management

Social impacts

Lack of information and awareness regarding menstruation pre-menarche can contribute to substantial anxiety, fear and lack of preparation for menses among adolescent girls.[41] In many countries worldwide, adolescent girls report experiencing isolation, embarrassment, shame and fear during menstruation.[17, 42, 43] In a study in India, 86% of girls felt 'completely unprepared' for their first menstruation, and 64% felt afraid at menarche.[44] The UNICEF study in Solomon Islands found that menstruation, particularly the onset of menstruation was associated with embarrassment, anger, fright and shame for many girls.[7]

Many girls and women worldwide experience restrictions to their behaviour and mobility during menstruation, which can impact on social activities. Menarche, the onset of menstruation, often brings with it new expectation for the way girls behave and interact with others, particularly boys and men. For example, girls may be expected to stay away from their peer group, stay away for boys and men, and avoid certain locations during menstruation.[17] In some contexts in the Pacific, taboos and norms relating to menstruation dictate that girls and women should not cook or eat certain foods, should not be near men and boys and, in some cases, should not wash themselves.[15] In some communities or for some girls and women, such restrictions may not be experienced negatively and may provide welcome opportunities to rest and spend time with other women.[18] Yet for others, such restrictions can negatively impact on social activities. For example. adolescent schoolgirls participating in the study by UNICEF in Solomon Islands reported that menstruation interferes with their participation in social activities.[7]

Stigma and silence around menstruation can contribute to gender inequality that continues to discriminate against girls and women throughout the lifecycle. Importantly, menstruation is not universally perceived or experienced as shameful, stigmatising or isolating. Indeed, menstruation itself may be associated with female power and creative forces.[18, 45, 46] Yet in some contexts, cultural perceptions and behavioural restrictions associated with menstruation can serve to isolate and stigmatise girls and women.[17, 47] School girls participating in studies in Ethiopia, Tanzania, South Sudan and Zimbabwe reporting being teased, humiliated, insulted and abused by boys at school during menstruation.[17] Women in workplaces also face humiliation and embarrassment during menstruation.[2] Where women prefer or are forced to manage menstruation at home, and are unable to seek healthcare for problems relating to

menstruation, they are unable to fully participate in cultural, educational, social and income-generating activities that could contribute to greater gender equality and greater economic productivity.

In many communities globally, menarche is perceived as a sign of maturity and that a girl has reached womanhood. In some settings, this transition may be celebrated either privately within the family or publicly in the wider community, as has been reported in Bougainville.[48] Menarche can also signify that a girl is ready to take on the work associated with womanhood, and that she has reached a marriageable or sexually available age.[49] Yet early marriage and sexual debut significantly increases the risk of early pregnancy, inadequate birth spacing, and reproductive health complications, and reduced social and economical capacity throughout a woman's life.[50]

Transgender men and those with non-binary gender identities can face additional challenges in managing menstruation, contributing to stigma and shame.[25, 26] Practical challenged such as sourcing MHM information and materials and managing menstruation discretely in public restrooms can have negative social and psychological impacts. Some authors have argued that the feminisation of language used in menstrual health education, research and product marketing has excluded transgender men and those with male gender identities' experiences of menstruation from conversations around menstruation and has increased stigma in these groups of menstruators.[25]

Education and employment impacts

Research suggests the menstruation can negatively impact on girl's participation and attendance at school. Mobility restrictions, lack of facilities to manage menstrual bleeding at school, fear of leakage or staining clothes and harassment by male students and teachers are significant deterrents to girls attending school identified in global [17, 51, 52] and Pacific research.[7] Poor confidence in menstrual materials and fear of leakage also contribute to reduces attention and participation in class.[17] A recent study in four provinces of Indonesia found that one in seven girls missed one or more days of secondary school a month due to an inability to manage menstruation safely and discretely at school. Adolescent schoolgirls participating in this study reported that an inability or preference not to change menstrual materials at school resulted in girls wearing the same MHM material (sanitary pad or reusable cloth) throughout the day which could cause itching and discomfort.[4] The study by UNICEF in Solomon Islands[7] found that menstruation is associated with missing classes or days at school, feeling distracted during class and reduced participation in sports. Girls also report being punished for using the bathroom during class.[7] In PNG, one small evaluation of an education support program found that girls miss school because they have to return home to change MHM materials[53] and that school water supplies were generally insufficient for MHM. Anecdotal reports also suggest that many girls in rural areas of Vanuatu do not attend school during a large portion of their menstrual period.[54] Prolonged periods of reduced participation and absenteeism can contribute to school drop-out and reduced educational attainment,[17] which can have long-term consequences for economic and health outcomes.[50, 55, 56]

Menstruation and an inability to manage menstrual bleeding at work can reduce women's participation in the workforce. Female garment factory workers in Bangladesh involved in the Her+Project initiative report that women commonly reuse cloth that has not been adequately washed or dried to absorb menstrual bleeding, and that this can result in extreme discomfort and infections.[5] This same initiative found that 73% of women miss work for on average six days a month, resulting in significant loss of income.[57] Menstrual pain – a symptom experiences by roughly 50% of women globally – can also impact on women's attendance and productivity at work.[2, 58] In Iran, roughly 10% of women who experience menstrual pain report missing between 1 and 3 days of work per month.[2] Women's work force participation has a demonstrated effect on economic growth.[59, 60]

Adolescents with a disability or special needs are disproportionately affected by challenges in managing menstruation at school. More than 90% of children with disabilities in developing countries do not attend schools.[61] A study in India found that 74% of adolescent girls with disabilities do not go to school. Of those that do go to school, 35% of adolescent girls with disabilities do not attend school during menstruation.[62] A qualitative study in Malawi found that women with disabilities reportedly often stop attending school when they reach menarche.[23]

Health impacts

Poor MHM practices are associated with pain and discomfort. Qualitative research with adolescent schoolgirls in Solomon Islands[7], Indonesia[4] and elsewhere[17] suggests that using inappropriate MHM materials and prolonged wearing of MHM materials as a result of challenges changing MHM materials at school can lead to genital itching and discomfort, and may contribute to infections. Anecdotal reports from Bangladesh garment factories also suggest that most women use cloth torn from old saris to absorb menstrual blood and that these reusable clothes are often not washed or dried properly[5], causing extreme discomfort and reportedly causing infections.

Many girls do not have the resources to manage menstrual pain. A study in Indonesia[4] and several countries in Africa[17] found that many girls and women lack the information or other resources to access and use basic analgesics to manage menstrual pain, and that this can negatively impact on participation and attendance at school and employment,[4] which can effect health outcomes for the individual woman and subsequently for her children.[50, 56]

While it is plausible that poor MHM practices increase the risk of reproductive tract infections (RTIs), the relationship between MHM and RTIs remains unclear.[63] Using unclean materials, insertion of unclean materials into the vaginal canal, use of highly absorbent tampons, frequent vaginal douching, and lack of handwashing have been suggested to increase the risk of infection. Yet research with adolescent girls suggests that these potentially harmful practices are common.[42] A systematic review conducted

in 2013 examined quantitative data collected on MHM and found no clear association between MHM practices and RTIs or any other important health outcomes. However this study also highlighted the lack of high quality evidence on this topic.[64]

Lack of appropriate and convenient facilities can also increase the risk of violence against girls and women. Girls and women in rural areas, urban slums and humanitarian settings, may need to walk considerable distances to access public facilities or to find a secluded place to change MHM materials. This can increase the risk of violence and causes considerable stress and anxiety.[1] However, particularly in contexts of high levels of sexual violence, there is little or no recent research on how cultural taboos around menstruation and taboos relating to sex during menstruation may impact on violence against women.

Research shows that girls and women with disabilities are two to three times more likely to experience physical or sexual violence than women living without disabilities.[24] Although this review found no literature on the link between MHM and violence among women and girls with a disability, risk of violence associated with lack of access to convenient and appropriate water and sanitation facilities may be higher in this population group. A situational analysis of disability in WASH in several communities in PNG's East Sepik Province in 2014 found that age, disability, gender and social status intersected to increase barriers to WASH access. The situation analysis also found that women with a disability faced an increased risk of violence when performing WASH related chores or accessing water and sanitation for their own personal use.[65]

3.3 Interventions to improve MHM

The Gates-commissioned review[1] found that momentum to address challenges associated with MHM has been building among donors, governments, NGOs and other stakeholders. However, efforts to date have largely focused on "hardware" (facilities and products), and focused on physically able girls in school, while failing to address other population groups and waste disposal issues. This review also found that interventions related to MHM have largely been delivered through the WASH sector, with little engagement from sexual and reproductive health, gender and education actors. The review recommended greater cross-sectoral collaboration to holistically and systemically address MHM.

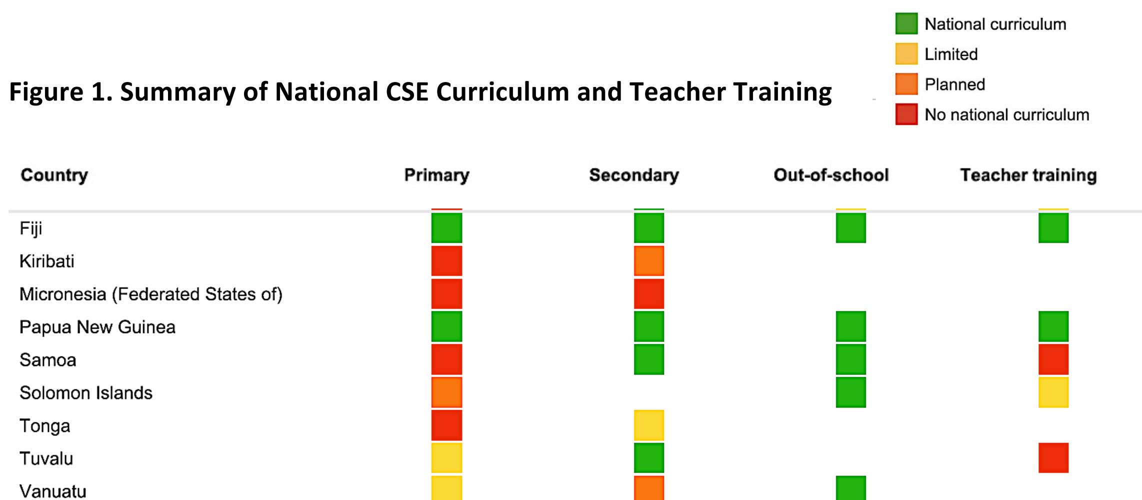
Experience from research and programs also highlight the need to engage female beneficiaries in all MHM initiatives. Well-designed educational programs, facilities and materials that involve women and girls in design and implementation can build self-esteem and self-worth and reduce potential harms for women, girls and other vulnerable groups.[66, 67]

Information and education

Education on menstruation can improve MHM practices and reduce social and behavioural restrictions during menstruation.[64, 68] There is growing evidence that when girls do not receive education and guidance about menstruation prior to menarche, they can experience fear, shame, embarrassment.[43] Menstruation education should ideally be taught as part of a program of comprehensive sexuality education (CSE), beginning before menarche and continuing throughout adolescence. Such education should aim to improve adolescent's knowledge of the biological process of menstruation, appropriate MHM, and menstrual health issues that girls and women can experience throughout their life cycle, such as endometriosis and irregular bleeding. CSE has been shown to change behaviour related to sexual and reproductive health. CSE has demonstrated positive effects on knowledge, attitudes and behaviours related to sexual and reproductive health, including promoting safer sexual practices such as delaying sexual debut, reducing the number of sexual partners, and increasing condom and contraceptive use.[69] Importantly, there is no evidence that sexuality education programs lead to early sexual debut or increased sexual activity. Such programs also provide opportunity to build life skills important for other aspects of adolescent development such as negotiating respectful relationship and promoting more equitable gender norms.

Sexuality education is currently implemented in a number of countries in the Pacific. Fiji, PNG, Samoa, Solomon Islands and Tuvalu currently have a national curriculum for secondary school students, while Tonga has a more limited implementation and Kiribati and Vanuatu have planned curriculum (refer Figure 1). Solomon Islands has a curriculum for out of school girls. Only Fiji, PNG, Tuvalu and Vanuatu also include curricula for primary students despite recommendations that age-appropriate CSE should be introduced in primary school before the onset of puberty.

Figure 1. Summary of National CSE Curriculum and Teacher Training



Source: UNFPA (2015)[10]

Even in the absence of CSE, teachers can be trained to provide targeted education to young people regarding menstruation and menstrual health and hygiene. In Vanuatu, Live and Learn Environmental Education (Live and Learn) have worked to include MHM

training as an elective in the national teaching curriculum and have established trusted MHM school wardens in a number of schools.[15] The CS Wash Fund Pacific Regional Learning Event noted that further work is needed in Vanuatu to make MHM training compulsory for teachers and to build teachers confidence and skills to share MHM information effectively with both boys and girls.

Programs that seek to improve knowledge regarding MHM should not just target girls and/or women, but should also seek to engage their influencers. Globally, puberty and sexuality programs and curricula often target girls while neglecting to include their influencers.[1] Careful attention should be paid to common and preferred sources of information regarding menstruation. In Vanuatu, adolescent girls and boys, preferred sources of sexual and reproductive health information included peer educators and teachers.[9]

Despite the demonstrated effect of informational interventions on improving MHM and reducing social restrictions, it is unclear whether improved MHM improves participation in education or employment.[63, 68] There is a lack of high-quality, rigorously designed quantitative studies to adequately assess whether improvements in MHM do in fact lead to improved participation in class, reduced absenteeism, and increased attendance at work.

MHM materials

Few market-based interventions have provided affordable, high-quality MHM products to low-income consumers in LMICs.[1] Several promising social enterprise models, such as ZanaAfrica, AFRIpads, and Sustainable Health Enterprises, have sought sustainable models, however cost-effective and reliable distribution channels, and taking the model to scale, remain a challenge. In Bangladesh, BRAC (an international NGO based in Bangladesh) established a social enterprise in 1999 making affordable, biodegradable sanitary napkins and delivering these products door to door in rural Bangladesh.[70] In Nepal, a local NGO 'MITRA Samaj' has an income generation arm known as 'MITINI Service' for sanitary waste collection and disposal.[70] Their service includes a team of professional cleaners and placement of dedicated sanitary napkin disposal bins in female toilets of various organisations, institutions and restaurants. Money raised through these activities is used to purchase disposable sanitary napkins for free distribution among adolescent girls in rural community schools. In India, a social enterprise that aims to increase the availability of safe and effective MHM materials has distributed machines that produce low-cost sanitary pads to women's groups and NGO's in poor rural areas.[71] Also in India, the micro-enterprise Vatsalya Foundation manufactures an affordable sanitary pads brand called Sakhi and has designed a low-cost incinerator for safe disposal of used sanitary pads.[72]

Some governments and NGOs are supplying free or low cost pads to girls, primarily in school settings. While some projects report reductions in school absenteeism as a result of such programs, rigorous evidence is lacking, and such programs may reduce the viability of commercially produced and supplied products.[1]

Financial planning and social enterprise intervention show promising results in increasing product accessibility. An evaluation of the Village Savings and Loan Association (VSLA) model in African found that VSLAs can support women to save and invest in strategic goods including MHM products. And improve the reliability of women's access to quality products.[1] Social enterprises employing women have also been used to increase MHM product availability in humanitarian settings.[73]

There is increasing interest among NGOs and donors in increasing women's access to re-usable and/or single use MHM products made from more environmentally friendly materials. Programs to introduce menstrual cups[74], pads made from locally available, low cost or biodegradable materials[*], and absorbent menstrual underwear[†] show promise in terms of acceptability. However, the relatively higher up-front cost of such products and taboos relating to insertable[‡] products may limit the scalability. There are also few studies that rigorously evaluate the effect of supplying MHM materials on participation in school, work or other activities. One such study supplied re-usable and hygienic menstrual cups to schoolgirls in four schools in Nepal.[74] This study found that actual school absenteeism during menstruation, as measured by school attendance records, was much lower than anecdotal reports suggested (on average girls missed only half a day per year during menstruation) and that despite good uptake of the menstrual cups, the intervention had no effect on school attendance.[74] This study underscores the need for rigorous evaluations of interventions to improve attendance at school and participation in other activities.

In humanitarian settings, organisations such as Red Cross, UNICEF, UNFPA and small NGOs often include MHM materials in relief packages. A 2016 review of MHM responses in emergencies found some progress in addressing MHM in emergencies.[75] However the review also found that most relief efforts focus on distributing hygiene or dignity kits , rather than addressing other needs of menstruating girls and women, such as appropriate bathing, washing, latrine and waste disposal. This review also highlighted a lack of consensus on the best approach to address MHM in emergencies and a lack of guidance to holistically address the menstruation needs of women and girls across sectors.[75]

Water, sanitation and hygiene (WASH) interventions

Several established and large-scale water and sanitation programs have added an explicit focus on menstrual hygiene. Such programs include UNICEF's WASH in Schools for Girls (WinS4Girls), a 14-country program under the broader WASH in Schools

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[*] For example, Health Enterprises, Days for Girls, SHE, Saathi pads, Afripads, Ruby Cup, MakaPad and J-PAL.

[†] For example, Be Girl.

[‡] Although note that some studies have found good uptake and acceptability of insertable MHM products such as menstrual cups, even in settings where researchers expected girls and their female guardians to report strong negative attitudes towards use of such products (Oster 2011, reference 74).

initiative and the BRAC-WASH program which has reached over 66 million people.[1] In Solomon Islands, the Ministry of Health and Medical Services and the Ministry of Education and Human Resources Development worked with UNICEF to develop technical design standards for school WASH infrastructure. These design standard have now been used by the Ministry of Education and Human Resources Development and NGOs to provide girl-friendly facilities in school across a range of provinces in the Solomon Islands.[7]

There is also now increasing recognition that WASH infrastructure is not sufficient to improve MHM and needs to be integrated with information and education relating to WASH and MHM, and efforts to ensure WASH programs are inclusive of people living with a disability and other vulnerable groups. For example, WaterAid and Vatsalya's Breaking Silence program in India aims to build self-esteem and empower women and girls through training and supporting female shopkeepers, health volunteers and students to work together to provide quality MHM-related information, sanitary products and disposal.[76] In PNG, WaterAid has supported the development of tools to ensure WASH projects involve people with a disability.[77]

Despite the emphasis on sanitation infrastructure, fewer programs emphasise menstrual waste collection and disposal.[1] Waste collection and disposal is clearly important for environmental reasons. However, collection and disposal facilities have also been likely to impact on whether girls and women use public and private facilities for changing MHM materials.[4] A mid-term review of a WaterAid inclusive WASH program in Zambia found 50% of girls with disabilities had no option for safe disposal of menstrual hygiene materials at home after use.[39]

National Policy

In general, Governments have tended to overlook issues relating to menstrual health and hygiene and have lacked ownership of MHM programs.[17] Government policies, especially through the imposition of tax, can impede access to appropriate MHM materials. Some governments are, however, seeking to increase the availability of free or low-cost MHM materials, particularly to low-income girls and women.[1] A recent study by the UNICEF East Asia and the Pacific Regional Office found that the Governments of Fiji, PNG and Solomon Islands are showing leadership on issues relating to MHM, including policy leadership and leadership in coordinating MHM initiatives.[78] For example:

- The Solomon Islands National Rural WASH policy (2015 – 2025) does not explicitly address menstrual hygiene management, although it mentions addressing the WASH needs of women and girls. Technical design standards for WASH in educational facilities contain MHM-friendly features.[79] These standards were developed in 2013 by the Ministry of Health and Medical Services (MHMS), the Ministry of Education and Human Resources Development (MEHRD) with support from Unicef.[7]
- In Fiji, the Ministry of Education, National Heritage, Culture and Arts developed Minimum Standards on Water, Sanitation and Hygiene (WASH) in Schools

Infrastructure in 2012.[80] The standards include MHM-friendly features such as disposal for sanitary pads.

- The Papua New Guinea WASH Policy 2015-2030 includes one specific mention of menstrual hygiene, stating that it should be part of sanitation subsidies. The WASH policy also includes a provision that *' participatory approaches should be fully inclusive to consider the involvement, priorities and needs of women and adolescent girls'*.[81] The Government of Papua New Guinea's National Quality School Standards Framework, 2013-2020, mentions the need for MHM disposal mechanisms. The Department of Education's 'Personal Development Teachers Guide' for upper primary school and lower secondary school has very little on MHM.[82] UNICEF's review of MHM in the region reported that the 'Health Promoting Schools - Student Teacher Course Book' integrates MHM and provides participatory activities for use in schools.[78]

3.4 Research into MHM

Methodologies for MHM formative research in LMIC's vary and there are currently no universal standards for assessing MHM or evaluating MHM interventions. UNICEF and Emory University have led global thinking on formative research approaches, including testing the application of an ecological framework[83] that has informed the research methodology for the Last Taboo Research Project. Most MHM studies rely on self-reported information (such as knowledge, attitudes and practice studies) about menstruation management which is likely to be subject to reporting bias, particularly as menstruation is a taboo topic in many places, making it difficult to discuss and report on openly.[63]

Evidence of human-centered design methodologies in menstrual hygiene research is limited, and has primarily focused on sanitary product development and sanitation facility design. In Indonesia, UNICEF are using human-centered design techniques to understand sanitary disposal mechanisms students wish to use.[84] In Uganda, Water for People are using human-centered design exercises to identify sanitation challenges and to contribute to the improved design of facilities, particularly around managing the disposal of used MHM materials.[85] The Last Taboo Research Project will draw on the principles of human-centered design, and on reported experiences from the abovementioned projects, to explore MHM needs and identify appropriate MHM interventions in the proposed study sites.

3.5 Overview of the strength of the evidence

There is good evidence that interventions to improve MHM can change behaviour relating to MHM and reduce behavioural and social restrictions faced by girls and women during menstruation.[1] This fact alone – that MHM interventions enable girls and women to manage menstruation effectively and with dignity – may be sufficient incentive for action by policymakers and donors.

The impact of MHM on educational outcomes has been relatively better studied, compared to other outcomes. However, while there is some anecdotal, qualitative and quantitative data from small studies suggesting that MHM impacts on classroom participation and school performance, rigorous studies are missing. While MHM has been associated with school absenteeism, evidence of this association varies dramatically between geographical areas and there is little evidence that improving MHM improves school attendance or participation.

Evidence is lacking on the effect of MHM practices on health outcomes such as RTIs and other sexual and reproductive health outcomes. A link between poor MHM and RTIs is plausible but the route of infection and causality has not been demonstrated. A potential link between poor MHM and increased vulnerability to STIs has been proposed but is not supported by current evidence. A lack of long-term studies also limits our understanding of the impact of menarche and MHM on sexual and reproductive health outcomes.

Evidence on the association between MHM and employment outcomes is completely lacking. We found no studies that associate MHM-related knowledge, attitudes our practices with employment outcomes, or the effect of MHM interventions on employment outcomes.

In general, evidence of the impact of MHM-related interventions on improving educational, employment and health outcomes is largely inconclusive.[1] Few rigorously designed, large-scale intervention studies have sought to assess these relationships. Most studies on menstrual health and hygiene are small, mostly qualitative, and over-rely on self-reported or anecdotal data to assess intervention effectiveness. Extreme variations in MHM practices, beliefs and taboos make it difficult to generalise across geographical areas. A 2013 systemic review of health and social effects of menstrual hygiene management literature found most studies used cross-sectional data and therefore causality of observed observations could not be made.[63]

4 GAPS AND OPPORTUNITIES

Key gaps identified MHM in programming and research globally include:

- **There is a lack of high quality intervention studies that seek to improve participation in school and work activities by improving MHM in these settings.** Such intervention studies also often fail to combine both "hardware" (infrastructure and products) and "software" (information and education).
- **Lack of research and programs that explore how menstruation can act as an opportunity to access adolescents at a critical transition point in their lives.** The need to engage young people in learning about menstruation may be an opportunity to provide adolescents with a broad range of information and skills relevant to sexual and reproductive health more broadly. For girls in particular, education on menstruation may present an opportunity to address gender-related and other social norms that have far-reaching effects throughout the lifecycle.
- **While teachers are often expected to provide puberty or menstruation education to teachers, many teachers do not receive adequate training to do so.** For menstrual health education programs to be effective, teachers must receive adequate training in the biological and psychosocial aspects of puberty, elements of good MHM, and teaching sensitive topics.
- **Few programs engage effectively with those who influence girls' ability to manage menstruation effectively and with dignity.** Such influencers include boys, men, older women, and health workers.
- **Few menstrual health and hygiene programs target out-of-school girls.** Programs such as government initiatives and mass media campaigns may reach out-of-school girls, including the many girls with a disability that are out of school. However few menstrual health education programs have been effective in improving MHM among highly vulnerable populations, including out-of-school girls, girls with disabilities, and HIV-positive girls.
- **Out-of-school girls have disproportionately limited access to toilets and washroom facilities during menstruation.** There is a need to increase the number of public and communal sanitation facilities that are available to vulnerable girls and women who are not in school. Additionally, poor public toilet maintenance can further restrict girls' mobility and access to public facilities. Most existing programs are also focused on physically able girls.
- **Few programs that supply free or low-cost MHM products adequately address sustainability issues.** Government provision of free or low-cost sanitary pads to girls and women may be prohibitively expensive in the long-term and may decrease incentives for social enterprises and private sector initiatives to supply MHM materials.
- **Government taxes on MHM products increase the cost of MHM products and make them unaffordable for some girls and women**. In many countries MHM

products are taxed as a "luxury" product. While some countries and states have successfully campaigned for removal of such taxes, sanitary products continue to be taxed in many LMIC and high-income countries.

- **Policymakers and sanitation service providers lack training on the specific needs of girls and women during menstruation**. Such training could help practitioners design more user-friendly policies and facilities both in schools and in communities. Inadequate human resources also present a challenge in supporting girl- and women-friendly facilities. In Solomon Islands, limited staffing in Ministry of Health and Medical Services and the Ministry of Education and Human Resources Development and lack of dedicated staff focused on WASH in Schools has been identified as a challenge for managing school-based MHM programming.[7]
- **Relatively few programs pay adequate attention to the hygienic and environmentally friendly collection and disposal of menstrual wast**e. Initiatives that seek to increase uptake of disposable MHM materials must be especially mindful of disposal constraints. Few rigorously designed studies have evaluated the effect of sanitation interventions on MHM outcomes, participation in education and employment, and girls' and women's empowerment.
- **There is a relative dearth of information on MHM policy, programs and research in the Pacific**. This review found no recent studies on cultural beliefs and taboos relating to menstruation in the Pacific, and how these beliefs might influence attitudes toward women's bodies and impact on gender equality. We also identified only one study focused on challenges related to MHM in the Pacific.[7] This study focused on school settings in Solomon Islands and identified the following key gaps:
    - Lack of initiatives to ensure girls have adequate MHM-related knowledge and skills to maintain their menstrual hygiene safely and effectively at school.
    - Inappropriate school policies, facilities and resources available to support girls (and also probably female teachers) in managing menstruation at school.
    - Lack of national and provincial level monitoring of school WASH facilities.
- **In the Pacific, DFAT supports MHM programming primarily through the WASH sector.** In PNG, DFAT-funded WASH programs have constructed safe, accessible, sex-segregated toilet facilities in schools, provided MHM information and education to girls, boys and men, and supported infrastructure improvements for the safe disposal of MHM products.[31] In Solomon Islands, DFAT provides sector budget support to the WASH sector through the Solomon Islands Ministry of Health and Medical Services. In Fiji, DFAT supports WASH activities through its Fiji Community Development Program and through a regional partnership with UNICEF.[31] Tailoring interventions to the specific MHM challenges and concerns expressed by local girls and women could enhance programming responses to MHM across the Pacific. To date, there is insufficient information available on MHM needs in the Pacific to allow DFAT and other stakeholders to respond effectively.

5 CONCLUSION

Girls and women of reproductive age account for approximately one quarter of the world's population. Most of these girls and women menstruate each month. Many girls and women worldwide face considerable challenges in managing menstruation safely and with dignity, including social norms and taboos relating to menstruation, lack of affordable, accessible and effective menstrual hygiene materials and lack of access to appropriate water, sanitation and hygiene facilities. As a result, menstruation can have substantial impacts on the ability of girls and women to participate in education, work and social activities, which is likely to have long-term impacts on education, health, economic and gender equality outcomes. While there is little recent research on menstrual health and hygiene in the Pacific, studies in Solomon Islands and PNG, and anecdotal evidence from Vanuatu, suggest that girls may face considerable challenges in managing menstruation at school, and that this can contribute to feelings of shame and anxiety, and reduced participation in education. Further research is needed to understand how menstruation, and the ability to manage menstruation effectively and with dignity, impacts on the lives of girls and women in the region.

Globally, interventions to improve access to information, MHM materials and WASH facilities have shown to improve MHM. However, there is little documented evidence from the Pacific, and rigorous evidence is generally lacking globally. While interventions to improve MHM have been shown to reduce social and behavioural restrictions on girls and women during menstruation, rigorous evidence on the impact of such interventions on health, educational, employment outcomes is lacking, both in the Pacific and globally.

This review has highlighted key opportunities for research, policy and programming, such as: including menstruation in age-appropriate comprehensive sexuality education for all girls and boys and their influencers, both in school and community settings; ensuring teachers are adequately trained and supported to support girls in schools; ensuring policymakers and practitioners have adequate knowledge and resources to implement school and public WASH facilities that are 'menstruation-friendly'; and initiatives to increase access to effective and affordable MHM materials.

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