Rapid Lit Review
Menstrual Hygiene Management (MHM)
Date of Review: 2016
Prepared by: Grace Tang, *WASH and Health Program Interns*

Purpose of Review
The purpose of this rapid literature review is to collect important information and data from recent research on the topic of menstrual hygiene management (MHM) to understand what is being done and what is known in the field. This document is a rapid review of key texts, rather than a systematic review of the subject literature. It is intended to signal key issues, gaps and bottlenecks, and best practices in the subject of MHM to highlight avenues of opportunity for future projects and research for Plan International USA.

Summary

- MHM is an important global issue as many girls and women in low and middle-income countries (LMICs) experience serious barriers to managing their menstruation safely and comfortably due to lack appropriate facilities, lack of the necessary supplies, shame and embarrassment, and various taboos related to menstruation.
- MHM has further highlighted the need for water access and sanitation coverage in general and in schools in particular to ensure that women and girls can manage their periods.
- MHM has typically been a neglected sub sector of WASH; however recently it has gained increasing attention from both the general public and the development sector.
- In many countries, menstruation is associated with strict taboos and sociocultural restrictions which make it difficult to address.
- MHM is increasingly being recognized as a public health and social problem evidenced by the fact that it is now included in some governments' agendas and as part of the global agenda

Nature of the Problem
Menstruation is part of the reproductive cycle of women and girls during which the uterine lining and blood are shed through the vagina (House, Mahon et al. 2012). Globally, 52% of the female population is of reproductive age and most of these women and girls will menstruate each month for between two and seven days. Menstruation starts at puberty, typically between the ages of ten and nineteen and continues until menopause, usually around late forties or mid-fifties. It is estimated that a woman will have 450 periods in her lifetime. At menarche, girls will experience both physical and hormonal changes. Physical changes include widening of the hips, growing breasts, and increasing body hair (House, Mahon et al. 2012). Hormonal changes include fluctuating levels of estrogen and progesterone. In addition, women and girls may experience menstrual cramps, bloating or discomfort associated with their periods, and may find self-hygiene care more cumbersome.

While the biological process of menstruation is the same across contexts, girls' lived experiences of menstruation differ widely from country to country and context to context. In LMICs, women and girls face more significant barriers to managing their menstruation than their counterparts in high income countries. Understanding these specific barriers and needs is critical for researchers

and practitioners wanting to draw attention to, or implement programming around the issue of MHM. Across contexts, women and girls have some universal basic needs to allow them to manage their menstruation safely and comfortably. Women and girls require sanitation and hygiene infrastructure, including a method of disposing used menstrual hygiene products. They also need menstrual hygiene supplies. They need education about what menstruation is and the options for managing it; if provided before the onset of menarche, this can help prepare girls for what is to come and allow them to adjust afterwards. Women and girls also need to live in positive and supportive environments where their actions are not restricted due to menstruation. Unfortunately, there are many beliefs, myths, and taboos that restrict the actions of girls during menstruation. Their school and work life is affected by menstruation. Without proper MHM, the rare event of health risks can occur. Boys and men can support girls and women during menstruation. Evidence and advocacy can highlight MHM as a public health problem.

Sanitation and Hygiene Infrastructure

Women and girls require adequate sanitation and hygiene infrastructure to properly manage their periods. During their periods, women and girls have increased need for a safe, private latrine as they may defecate more frequently, and so that they have a place to change their menstrual hygiene materials as necessary. Unfortunately, around the world, over two billion people lack access to improved sanitation facilities, and even more lack access to girl-friendly sanitation facilities. Common factors that make sanitation facilities not girl friendly include:1) lack of latrines or an insufficient number of latrines; 2) latrines are not private, safe or of high quality design; 3) insufficient (clean) water available in close proximity to and/or inside latrines; 4) lack of adequate ways to dispose of used sanitary materials such as dust bins or incinerators or pits; and 5) lack of places for washing, drying, and ironing of menstrual clothes (Sommer 2010). Inadequate access to the necessary sanitation and hygiene facilities can have serious consequences. In Ethiopia, the lack of separate facilities in schools deters girls from using facilities and also deters them from going to school (Tegegne and Sisay 2014). In rural Kenya, girls have difficulty in managing their periods at school due to the lack of water and an inability to bathe (McMahon, Winch et al. 2011).

Menstrual Hygiene Supplies

Types of menstrual hygiene supplies vary across the world and can include cloths, toilet tissue, disposable pads, reusable pads, birth control, menstrual cups, and tampons. Many women and girls around the world do not have access to dedicated menstrual hygiene products; instead, they use improvised materials such as cloth or rags; in Tanzania 82% of women rely on cloth or toilet paper; in Nigeria, 31% to 56% of school girls use toilet tissue or cloth to absorb menstrual blood; in the Gambia, only a third of women regularly used sanitary pads; and in India, 43% to 88% of girls wash and reuse cotton cloth (Sumpter and Torondel 2013). If these materials are washed and dried hygienically, this can be an effective method of MHM. Unfortunately, multiple studies from around the world report frequent usage of unsanitary absorbents, such as rags, and inadequate washing and drying of reused absorbents. Frequently, women and girls wash these materials without soap and clean water, and dry them indoors instead of outside in the sun, which can allow bacterial growth.

There are many other types of menstrual hygiene supplies that could be made available to women and girls. Disposable sanitary pads have been considered a good form of menstrual

hygiene because unless reused, they are hygienic and relatively inexpensive (Sumpter and Torondel 2013); however, there are disadvantages to their use. A study conducted in Ethiopia showed that only 35.38% of girls used disposable sanitary napkins during their last period. Reasons for not using disposables included: the lack of money; feeling ashamed to buy them from shops; lack of availability in the area; and lack of knowledge on how to use them (Tegegne and Sisay 2014). In addition, disposal of these products poses particular personal and environmental challenges (discussed below).

Reusable pads are another alternative option; they tend to be more effective than cloth and rags, and are more sustainable than disposable options. In Uganda, a year's supply of commercially produced, disposable sanitary pads costs ten times more than an annual supply of Afripads[1] and three times more than Makapads[1] (Crofts and Fisher 2012). However, as with rags and cloths, reusable pads must be hygienically washed and dried, which can be difficult in contexts where clean water and soap are scarce, and where women and girls are not comfortable drying menstrual products outside.

Menstrual cups are also another potential menstrual hygiene product; however they have been less widely promoted and are used less frequently. The Mooncup[2] has been used in a pilot feasibility study in rural western Kenya and a randomized control trial in south western Nepal. The study with adolescent girls from Kenya saw mostly positive results such as no/less leakage, freedom to move and exercise, and ability to concentrate in class (Sahin, Mason et al. 2015). Similarly, the participating adolescent girls in the study in Nepal reported that the advantages of the cup included: increased mobility; ease of use; and no need to wash menstrual cloths (Oster and Thornton 2012).

Disposal of Menstrual Hygiene Supplies

As mentioned above, disposable menstrual hygiene products have generally been considered a good method of menstrual hygiene, as they are hygienic and relatively inexpensive. However, for disposable products to be a viable option, women and girls must be able to dispose of the used products properly and easily. Common methods of disposal of used disposable sanitary materials include:

- Throwing it into an open field, which contributes to environmental waste;
- Burial, which is taboo in many cultures, and can lead to environmental problems;
- Throwing it into a latrine, which can cause the latrine to fill up more quickly;
- Flushing it, which can cause blockages in pipes and sewerage lines;
- Incineration, which can release chemicals into the air if the product is made from synthetic materials.

This isn't a small problem. In her lifetime, a women who can afford disposable menstrual products, is likely to use an estimated 15,000 sanitary pads or tampons and throw away 125 to 150 kg of tampons, pads, and applicators (Kjellén, Pensulo et al. 2012). When these materials are improperly disposed of, they can cause significant problems. In urban water based facilities in developing countries, menstruation products such as menstrual pads, rags, cotton wool, and tampons are often found to be blocking sewerage lines and pipes (Kjellén, Pensulo et al. 2012).

[1] Types of reusable pads
[2] A type of menstrual cup

In Dar es Salaam, Tanzania, there are an average of 150 blockages per month, costing an estimated $25,000 USD per month. In Cochabamba, Bolivia, menstrual products are frequently found in sewer blockages at schools, accounting for 60% of blockages. Disposal of menstrual products also creates problems in less formal sanitation systems. In latrine systems in Africa and South Asia, menstrual waste is commonly disposed of in pit latrines, causing the latrines to fill up more quickly, adding to the issue of sustainability. The menstrual waste can also complicate the process of emptying pit latrines, particularly the use of vacuums which develop blockages.

Education (lack of education)
Menstruation is a sensitive topic, and many women are too shy or embarrassed to talk about it. In many countries, girls may have little to no knowledge about menstruation before menarche as it is not taught in many classrooms and it is not discussed at the household level. Because of this, menarche can be can be frightening (House, Mahon et al. 2012). If a girl does not know about menstruation, she can be shocked to see blood coming out of her vagina and may think that she is sick, dying, or done something wrong and will be punished. In a study with school girls without pre-menarcheal training in Nigeria, 27.9% of girls experienced confusion and 33.3% of girls experienced fright (Aniebue, Aniebue et al. 2009). The same study also showed that pre-menarcheal education can help girls adapt well to menstruation and also maintain a social life during menstruation. 58.6% of girls who had pre-menarcheal training were expectant of their menarche. 33.3% of girls who had pre-menarcheal training said their menstruation had no effect on their schooling and social life.

Beliefs, Myths, and Taboos (Social Issues)
Cultural and religious beliefs, myths, and taboos about menstruation affect the behaviors and habits of women and girls all over the world (House, Mahon et al. 2012). Religions such as Buddhism, Christianity, Hinduism, Islam, and Judaism all have some restrictions on what women and girls can and cannot do during menstruation. For example, according to Islam, a woman is considered ritually impure for the entire duration of menstruation. She cannot continue the five daily prayers, fasting during the month of Ramadan, or sit in a mosque. After her period ends, a woman is supposed to have a ritual bath before she can resume her religious obligations. It is also suggested that women wear different clothes during menstruation so her husband is made aware, without the topic ever being discussed.

In addition to religious customs, many cultures have traditional beliefs related to menstruation, including some about evil spirits, curses, and the power of menstrual blood. In Tanzania, some believe that if a used menstrual cloth is seen by others, the owner will be cursed (House, Mahon et al. 2012). Similarly, women in Bangladesh bury their menstrual cloths to prevent them from being used by evil spirits. In Surinam, it is believed that a woman can use her menstrual blood to impose her will on a man.

School and Social Life
A number of small scale studies have reported that menstruation leads to absenteeism among pubescent age school girls (Tegegne and Sisay 2014). The amount of absenteeism varies among different countries and contexts. One study in Ethiopia found that some female students missed exams when the exams coincided with their menstruation days due to lack of pads and

underwear to manage their menstrual bleeding, severe pain, and embarrassment (Tegegne and Sisay 2014). The same study found that the girls thought that menstruation had negatively affected their academic performance or rank. They cited trouble concentrating during menstruation, poor class attendance, pain, having class tests during their period, and inability to properly prepare for tests because of menstruation related-problems as the key causes of this. Some girls even dropped out of school due to embarrassment, lack of menstrual products, lack of cleanliness and insufficient access to water and separate toilets at school. In other social contexts, South Indian girls are taken out of school by their parents, mostly to be married (Mahon and Fernandes 2010). This was because menstruation was a sign of marriage or a dangerous and shameful indication of an unmarried pubescent girl. In both Nepal and India, girls report being absent from school for some time, citing the lack of privacy for cleaning and washing or lack of facilities. Even items like menstrual cups may not help with improving school attendance. A randomized control trial using menstrual cups in south western Nepal showed that the product had little effect on school attendance (Oster and Thornton 2011).

Workplace

There are 1.2 billion women employed globally, of which menstrual aged girls and women (~12 to 49 years) represent a significant portion (Sommer, Chandraratna et al. 2016). However, both formal and informal workplaces may lack a suitable environment for women's sanitation-related needs. In rural areas, many women are engaged in agricultural work, and these environments frequently lack sanitation facilities, are remotely located, and women typically work very long days in the fields. Several factors limit the quality of MHM standards in the workplace including: problems of social norms and unvoiced needs, advocacy, and policy. Lack of support for MHM in the workplace has social, financial and health consequences. No access to appropriate toilets may cause women to not come into work, losing income for themselves and their employers. Also, stress and difficulty concentrating may lower productivity. Ministries of Health, trade related ministries, private companies, and employers have a responsibility to prioritize MHM and take action.

Health Risks of Poor Menstrual Hygiene Management (Physical/Mental Health Issues)

Poor health issues due to poor menstrual hygiene are uncommon but can be serious when they occur. Outcomes due to the lack of proper hygiene and menstrual management include: reproductive tract infections (RTIs), bacterial vaginosis (BV), vulvovaginal candidiasis (VVC), urinary tract infections (UTI), anemia, and vaginal discharge (Sumpter and Torondel 2013). Left untreated, RTIs can lead to potentially fatal toxic shock syndrome, 10-15% of fetal wastage, and 30-50% of prenatal infection (Garg, Goyal et al. 2012). RTIs are also linked with the incidence of cervical cancer, HIV/AIDS, infertility, ectopic pregnancy, and other symptoms. Menstruation can also affect mental health, particularly in places where menstruation is particularly taboo. Women and girls may experience anxiety, fear, confusion, and depression (DS and CH 2005).

Boys, Men, and MHM

Boys and men must also be part of the conversation around MHM to help support girls and women in their lives. Gender inequality plays a role in why MHM is a neglected topic in households, communities, and schools where unequal power relations between men and women lead to women's and girls' voices not being heard (Mahon, Tripathy et al. 2015). Engaging boys and male school teachers helps to diffuse stressful and stigmatizing environments for girls. In

households, engaging men can help women and girls who need money in buying menstrual materials and when using hygiene and sanitation facilities.

Despite the necessity of engaging men and boys around this topic, it is often challenging. An assessment of a WaterAid project in India showed that engaging men and boys in MHM had its challenges. The project worked to reduce gender inequity and exclusion by challenging taboos, social norms, and stigmas around menstruation. Masons were trained to construct MHM appropriate hygiene and sanitation facilities to enable girls and women to manage their menstruation with dignity and privacy. At first, WaterAid met strong resistance when trying to discuss menstrual hygiene topics with men and boys due to prejudices, myths and misconceptions; however, they found that through regular meetings and inter-personal communication, this resistance began to fade (Mahon, Tripathy et al. 2015). When boys and men adopt more positive perceptions of menstruation, this helps to reduce shame and embarrassment and restores women and girls' dignity and self-esteem.

Gap Analysis

Despite the growing base of information described above, there are still gaps of knowledge in the field of MHM.

Partnerships across sectors

In many recent studies and evaluations of MHM projects, a common reported challenge is the lack of coordination and partnership to address MHM across sectors. There remains a pervasive lack of knowledge, awareness and information within many sectors about this critical topic. To date, MHM has primarily been seen as an issue for the WASH sector, despite the wide ranging causes and consequences. The WASH sector has advocated for the engagement of other sectors as it cannot act alone in addressing the issues of MHM; instead education, and sexual and reproductive health, and other sectors must all work to address these needs (Sommer, 2015). A multi-sectorial approach to intervene on the issues on MHM can better address challenges and increase the number of stakeholders globally.

Lack of sanitation facilities

As noted above, another large gap is the lack of access to MHM-appropriate sanitation facilities. Globally, only 68% of the population uses an improved sanitation facility, and classification as an improved sanitation facility does not necessarily mean that they are MHM-friendly. Furthermore, in 2013, only 66% of schools had access to adequate sanitation facilities (JMP, 2015)

Need for additional research

There is a need for additional research regarding menstruation, women and girls' lived experiences of menstruation and MHM approaches. Larger trials are needed in order to vet the true effectiveness of MHM hardware and software interventions (Hennegan and Montgomery 2016). There is also a need for research on the effects of MHM projects on girls' lives, particularly self-efficacy, confidence, academic performance, and school and work attendance. Additionally, there needs to be research of the socio-cultural barriers to MHM in different localities and contexts. In addition, Sumpter and Torondel noted in their systematic review that there was a reluctance to publish null research results (Sumpter and Torondel 2013). They also

noted that there were several methodological shortcomings in health research. This included lack of adjustment for confounding, particularly socio-economic status and sexual activity; limited discussion of the issue of concurrent infection; lack of specificity in case definitions; and reliance on observational evidence.

MHM in Conflict and Post-conflict Settings
More research is needed to understand the specific menstrual health needs and challenges of women and girls in post-conflict settings (Sommer 2010). There have been efforts to provide menstrual materials to women and girls in post-conflict and emergency settings, however, more research is needed in this area (Sommer 2012). To date, MHM interventions in post-conflict settings have been limited. Most distributions of hygiene kits in post-conflict settings are a one-time event. This is usually conducted by the WASH sector, in conjunction with constructing water and sanitation facilities. In addition, UN agencies such as UNICEF and UNFPA or NGOs such as Oxfam and CARE created their own kits for distribution. More research and implementation experience is needed to understand how interventions can best address menstrual health in these settings.

In addition, more research is needed to understand how conflict affects menstruation. According to one study, living in a conflict zone for a sustained period can affect women's menstrual cycles (Hannoun, Nassar et al. 2007). In this study, 661 women were separated into three groups: women staying in the war zone, women displaced, and a control group. The study showed that during the time of war, all women had regular menstrual cycles. However, 3 months later 35.3% of women in the war zone, 10.5% of displaced women, and 2.6% of the control group had menstrual irregularities. Menstrual irregularities were defined as when cycle-to-cycle interval variations exceeded 6 days and when cycles were either short (less than 21 days) or long (longer than 38 days). 6 months later, 18.6% of women in the war zone, 4.3% of women displaced, and 3.9% of the control group had irregular periods.

MHM in Humanitarian Emergencies
During emergencies, women and girls can face significant challenges to managing their menstruation including: loss or disruption of usual coping strategies for managing menstruation; living in confined crowded environments; financial challenges; and difficulty in accessing water supplies, sanitation, and hygiene items (Hayden 2012). Other challenges include taking care of injured family members and losing MHM support structures such as teachers, friends, and family members. Girls and women noted that while hygiene kits were sometimes provided, not all of them received it and no information was provided on managing period pain, smell, and using new MHM products (Hayden 2012).

Birth Control
Another gap in literature is the use of birth control such as Long Acting Reversible Contraception (LARC) methods as a way of managing menstruation (Callahan 2015). A study by Johnston-Robledo et al showed that many college aged women do not appear to be knowledgeable about menstruation suppression (Johnston-Robledo, Ball et al. 2003). A study with women in Edinburgh, Cape Town, Hong Kong, Shanghai and Nigeria showed that many were willing to use contraception that halted menstruation (Glasier, Smith et al. 2003).

MHM in Special Circumstances

Lastly, the literature base lacks sufficient information about providing MHM to girls and women in vulnerable, marginalized, and special circumstances (House, Mahon et al. 2012). Girls with intellectual disabilities take longer to learn the skills required for menstrual management (Tracy, Grover et al. 2016). Problems such as blood on clothing, pads put in inappropriate places, or disclosure of private information at inappropriate times or places may reflect a lack of understanding of practical steps required or appropriate social behaviors. In addition, women and girls with physical disabilities may have unique challenges to managing their menstruation which must be addressed.

MHM Approaches and Solutions

While there is no concrete definition of what exactly encapsulates MHM, interventions typically include the following components: access to safe and private latrines with easily accessible water; culturally appropriate menstrual hygiene materials; socially and environmentally appropriate means of disposal of used sanitary materials or private washing and drying for cloths; and practical information on hygienic menstrual management (Sommer 2012). The common MHM approaches include two types of interventions: hardware and software (Hennegan and Montgomery 2016). Hardware interventions include provision of clean absorbents/sanitary products which could be disposable or reusable, and improved WASH or girl-friendly facilities. Included in improved WASH or girl-friendly facilities are aspects such as clean water supply for menstruation management, provision of soap or disinfectant for body and absorbent cleaning, improved absorbent disposal facilities, and improvements to latrine privacy or safety. Software interventions include delivery of sufficient education to provide an understanding of the biological process of menstruation to improve MHM practices or misconceptions and confusion; and interventions to address taboo and stigma. Information could be provided in person or by printed or electronic resources. Most organizations have a combination of both hardware and software approaches in their MHM programming and the best practices involve culturally appropriate approaches that use local resources.

Addressing MHM in Humanitarian emergencies

There are several approaches to meeting the needs of women and girls during humanitarian emergencies. Three phases of planning in humanitarian emergencies should be considered:preparatory, response and early recovery, and recovery and regular programming. Recommendations for the preparatory phase includes initiating discussions within UNICEF of the different section stakeholders to determine key responsibilities and preparedness action to be taken, conduct of social mapping of different cultural and social groups within the country with focus on specific gender base norms and requirements to MHM, identification of locally appropriate, and effective mechanisms to gather information from potentially affected women and adolescent girls and integrating this into the planning, implementation, and monitoring process. Other recommendations include identifying which technical working group within the WASH sectorial platform would be responsible for MHM to identify areas of stronger collaboration between partners and different clusters that are involved in MHM in emergencies where key outputs would be to determine who is responsible for providing MHM support and identifying shortfalls and overlap in response. Additionally, there needs to be identification of a supply and distribution mechanism where specific supplies should be determined by a working group with beneficiary input from different cultures and age groups, in maintaining cultural

gender acceptability, the items specifically for MHM should be separately packaged and clearly marked as female hygiene products. Finally, there needs to be a review of monitoring and assessment tools, and the incorporation of key observational questions within the rapid assessment tools with specific focus on gender access and suitability and safety of water and sanitation facilities.

Advocacy

It is critical to increase awareness about the issue of menstruation and the challenges that many women and girls face managing it. Although menstrual health is gaining significant traction, it remains an underfunded and often ignored sub-sector. In recent years, NGOs, UN entities, academic sectors and private-public partnerships, helped collectively raise awareness about the issues of MHM and began to take collective action on this issue. The WASH sector led the efforts, through the WASH in schools lens, by creating allies in education sectors to lead efforts (Sommer, 2015). Moving forwards, continued advocacy is necessary to increase the attention paid to this issue.

Current and Past MHM projects

Below is a list of innovative current and past MHM projects from various organizations.

SNV – Girls in Control

In January 2014, SNV launched a pilot program addressing menstrual hygiene management in five countries (Ethiopia, South Sudan, Tanzania, Uganda, and Zimbabwe) across 25 districts and 490 schools (Tamiru). Girls in Control focuses on the provision of appropriate, girl-friendly, water, sanitation, and hygiene facilities in schools, information about MHM, and improved access to sanitary materials. 141,110 school girls and 3,000 female teachers in 491 schools across the five countries have access to supply of safe and affordable menstrual hygiene management materials. Girls and women have been trained to sew reusable pads using local materials. The program also aimed to reach 8 million people though awareness raising campaigns, dialogues, and advocacy events. At the end of 2014, the program in South Sudan provided information on managing menstrual hygiene and using reusable pads to over 4,500 school girls. Activities included: 1) school meetings for awareness creation; 2) information dissemination through "Talking Compounds" and posters with key MHM messages; and 3) training in making reusable menstrual pads through school health clubs. In Ethiopia, a reusable sanitary pad factory has been occupied with producing sanitary kits containing: four reusable pads, two pairs of underwear, soap, and a hygiene message. At the end of 2014, 1,600 pads and 600 pairs of underwear have been distributed in Amhara, Oromia, and Tigray, and 1,123 reusable pads in SNNPR, to 2,723 school girls. 148 people have been trained as trainers in reusable sanitary pad production and hygienic use of the pads. In Zimbabwe at the end of 2014, 15 local builders have been trained to construct girl-friendly latrines and 100 girl-friendly latrine units have been constructed in 20 schools. Introduced is an innovative financing system for the reusable menstrual pads, where a revolving fund with installments and direct cash payments is set up. The Girls in Control program is particularly innovative because it has partnerships with ministries of education, health, women and youth, and water in the five countries, where each country has a unique approach to MHM programming.

UNICEF Pakistan – Learning, Acting, and Learning (MHM)

This was an exploratory research project conducted from July 2013 to April 2014 where the research findings informed the design of interventions. The qualitative study included focus group discussions, in-depth interviews, and observation checklists. Several interventions after the learning and research addressed MHM, including: the formation of WASH clubs; the development and distribution of behavior change communication materials on MHM; the development and strengthening of the mechanism for distribution of MHM supplies; and improved WASH facilities (Sahin, Naeem et al. 2015). As a result of the project, girls in schools mentioned being more comfortable going to the toilet, thought that teachers were more understanding and lenient towards girls during menses, and saw that their schools were providing underwear and sanitary napkins in brown paper bags. The project interventions were especially innovative in that they came from advanced research.

Plan International USA – Menstrual Hygiene Management (MHM) Project
The five year MHM Project in Uganda started in 2012 and aims to help 100,000 rural women and girls. The project seeks to improve knowledge, attitudes, and practices by working closely with teachers, community health workers, village volunteers, and the communities at large in participatory and creative ways to increase knowledge and break down stigma. It works to increase access to affordable and hygienic sanitary pads among rural women and adolescent girls by partnering with the social enterprise, AFRIpads, which manufactures reusable pads and by increasing the number of AFRIpads dealers. Lastly, the project aims to improve capacity of income generation for women by providing volunteers with business and marketing training necessary to become an AFRIpads dealer. This project is innovative because it targets several actions at once, namely providing pads and training volunteers in business and marketing.

Major Stakeholders

There are a number of major stakeholders including multilateral organizations, civil society organizations, non-governmental organizations, and the private sector involved in MHM.

Multilateral Organizations

UN Women is a primary UN organization involved in menstrual health. UN Women provides: intergovernmental support; UN system coordination; training for gender equality and women's empowerment; program and technical assistance, and research and data. UN Women has collaborated with other organizations to call for global action on ending menstruation taboos and reversing neglect. Other MHM activities include co-organizing a five day workshop in Cameroon on MHM.

UNICEF has also played a major role in advocacy and programming around menstrual health. UNICEF has programs in MHM addressing girls' sanitation and hygiene needs, menstrual supplies access, incineration of waste, and menstrual taboo and myths.

CSOs and NGOs

The Water Supply and Sanitation Collaborative Council (WSSCC) is the only part of the UN that works solely in sanitation and hygiene by supporting national coalitions, working directly with government agencies, ensuring and analyzing policies, and developing awareness campaigns. They specifically work on MHM through trainings, national conferences, other events, and implemented projects.

WaterAid believes that women and girls have the right to manage menstruation safely. They work with some of the world's poorest communities to address taboos surrounding menstruation, build separate toilets and taps, and start hygiene clubs where girls can learn about their health and how to make reusable sanitary towels. WaterAid is one of the key players in advocacy initiatives surrounding MHM. The organization also helped write the book, "Menstruation Matters".

SNV has been established since 1965 as an organization that focuses on agriculture, energy, and targets four distinct product areas of WASH. Sustainable Sanitation & Hygiene for All (SSH4A), Urban Sanitation & Hygiene for Health and Development (USHHD), Functionality of Rural Water Supply Services (FRWSS), and Urban Water Supply Services (UWSS) are their core product areas. SNV is a distinct stakeholder in that it has MHM projects in several countries that address stigma and taboos, education, and menstrual hygiene supplies. For example, the Girls in Control program operates in five countries and focuses on the provision of appropriate, girl-friendly, water, sanitation, and hygiene facilities in schools, information about MHM, and improved access to sanitary materials.

Plan International recently produced the results of a survey on the various types of MHM projects within the federation. Results showed that of the 17 country respondents, 16 have programs in 12 countries in Africa and Asia on MHM within the last five years. Projects focused on various issues such as facilities, supplies, knowledge and education, and stigma and taboos. Women and girls are the principal targets of MHM programming but boys and men, teachers, government officials, and healthcare workers are also main stakeholders. Schools and communities are the most common locations for MHM programming; however, healthcare facilities, work places, savings groups and other locations are also targeted.

Private Sector

Procter and Gamble supports various projects in partnership with international and local organizations. Such collaborations include a three year commitment in 2006 to fund sanitary pads for 15,000 girls in Kenya (Millington and Bolton 2015). *Always Keeping Girls in School* is a current campaign implemented in partnership with the Department of Basic Education, UNICEF, the Small Projects Foundation, and other stakeholders in South Africa. The campaign provides puberty education, Always brand sanitary protection, access to educational resources and motivation to stay in school. Procter and Gamble have also partnered with Save the Children in 2014 in Mexico to teach girls about menstrual hygiene and distributed 2,900 sanitary pads. With the Centre for Gender Equity, Proctor and Gamble provided sanitary pads and puberty education to over 20,000 girls between the ages of eleven and eighteen in six African countries. In partnering with Plan, Procter and Gamble funded Plan India's Right to Optimal Health program. The program aimed to improve knowledge, attitude, and practices among adolescent girls in reproductive health and menstrual hygiene. During June 2011 to May 2012, some 300,063 girls from 1,870 schools were oriented on menstrual hygiene and reproductive health. Training topics included symptoms of reproductive tract infections and correct usage of sanitary napkins.

Johnson & Johnson funded a project in Nairobi, Kenya to make reusable pads (Millington and Bolton 2015). The pads come in a kit with pants, a water proof storage bag, and soap for washing pads. Additionally, the kit came with information on HIV and AIDS prevention, contacts for counseling services in the neighborhood, voluntary counselling and testing services, and a manual on how to use the pads. Johnson & Johnson supported BRAC USA's Adolescent Development Program which aims to educate and empower adolescent girls by strengthening their health literacy and life skills, including menstrual hygiene (Johnson 2016). With Water.org, Johnson & Johnson have been working with them since 2009 to bring clean water, improved sanitation, and hygiene education to urban slum residents in Dhaka. The company supports a menstrual health and hygiene education program aiming to reach at least 10,000 women and girls.

Nike Foundation started the Girl Effect, an incubator that supports social entrepreneurship. One project is Flo, a washer and dryer for reusable pads that uses two bowls and strings to spin the bowls together. After spinning, the bowls turn into a drying rack for the reusable pads (Miller 2015).

Sustainable Health Enterprises (SHE) started an innovative social business in 2008 to manufacture and distribute affordable menstrual hygiene pads in Rwanda (2015). go! pads are grown, manufactured, processed, and sold in the local market. SHE provides farmers with equipment to process banana trunk fiber which they then sell to SHE. At their factory, SHE then processes the banana fiber to manufacture an absorbent material for pad filling. The pads are assembled and packaged locally and are sold at affordable prices. SHE also engages in education and advocacy surrounding menstrual hygiene.

Afripads is a social enterprise that focuses on local manufacture and global supply of reusable sanitary pads as a cost-effective menstrual hygiene solution. It operates by employing a 90% female staff who are responsible for manufacturing their innovative menstrual hygiene solution. The menstrual kits are made from high-performance textiles and provide effective protection for a year or more of menstrual cycles. Their product enables women and girls to stay in school, go to work, and participate in daily life with confidence and dignity.

BeGirl was established in 2014 as a social enterprise dedicated to meeting the needs of more than 250 million adolescent girls lacking access to appropriate menstrual products. They have currently reached 9,091 girls with 16,671 Be Girl products distributed in 23 countries. Be Girl has a buy-one, give-one campaign where if a Be Girl product is bought in developed countries, a Be Girl period product is given to someone in need. Their products include a BeGirl Panty and a FlexiPad. Both have pouches for absorbent disposable or reusable materials and are made of advanced textiles and design. A BeGirl Panty provides more than a year of protection and a FlexiPad provides a year of protection. Both are convenient products with quick drying times, less usage of water for washing, and stain-free properties.

Thinx was founded in January 2014 and sells different pairs of underwear for women with periods. Thinx underwear have four layers: moisture-wicking, anti-microbial, absorbent, and leak-resistant. The company is partnered with Afripads in Uganda. Every pair of Thinx underwear sold will have the funds go to an Afripads set for girls in developing countries.

Best Practices in MHM

The best approach to MHM programming is including both hardware and software interventions within the same program or project to address the multiple challenges that women and girls face in managing their menstruation. Ideally, these interventions should address outcomes such as improving reproductive health, improving school attendance and work attendance, mitigating psychosocial consequences, and improving knowledge of menstrual hygiene practice.

Software interventions

It was found that education programs can have some effect on preparation for menstruation and can improve menstrual practices in girls already in education (Sumpter and Torondel 2013). In a systematic review about hardware and software interventions, software interventions were found to generally improve knowledge about menstruation (Hennegan and Montgomery 2016). Some supporting evidence was found for menstrual knowledge improving girls' MHM and reducing negative psychosocial consequences. Software interventions also include engaging men and boys and addressing stigma. WaterAid in India had project components in engaging men and boys in supporting women and girls and training masons to construct MHM-friendly sanitation structures. In addressing stigma, female health groups or "big sister" groups that prioritize female menstrual hygiene management could be created (McMahon, Winch et al. 2011). Schools could be encouraged or supported to provide safe, private spaces where girls can take care of their hygienic needs. Families including mothers and fathers could be incorporated into the educational experience. Teachers could be trained to teach the subjects of menstruation and puberty and how to pass accurate information to their students.

Hardware interventions

Provision of pads also may help with reducing menstruation-related anxiety and potentially enhance girls' receptiveness to classroom instruction (Dolan, Ryus et al. 2014). Wilson et al.'s study showed that teaching rural Kenyan school girls about making the reusable Mwezi sanitary pad had some effect on attendance (Wilson, Reeve et al. 2012). The proportion of students missing school in the intervention arm dropped by 18.6% and the proportion of students in the control arm remained constant. On the other hand, the provision of a menstrual cup to adolescent girls in south western Nepal showed a 1.0 percentage point decrease in school attendance (Oster and Thornton 2011). Sanitation facilities should be girl-friendly with locks, space, private washing areas, and a places for washing, drying, and or disposal of soiled sanitary protection (Pillitteri 2011). Hand-washing facilities and soap also need to be provided. Simple hand washing tools such as the tippy tap can be used in place of a more permanent solution.

Combined interventions

During an intervention that included pads and education, attendance rose by 9% (Dolan, Ryus et al. 2014). At sites with both education and pads, shame, lack of confidence, insecurity, and difficulty concentrating were improved following the intervention. However, Dolan et al. reported that same outcomes did not improve in the education-only arm of the study.

Conclusions

MHM has an impact on the health, education and development of women and girls in many LMICs. Education, cultural practices and a lack of services for MHM can limit or reduce girls' access to education (Mahon, 2010). To address this, MHM must be addressed through multi-sectorial initiatives that move beyond the WASH sector to include expertise from education, emergency response, etc. Menstrual health must be better incorporated into governments' agendas and into funding opportunities.

References

(2011, 05/13/2011). "Keeping Girls in School - Always!". Retrieved 9/6/2016, 2016, from https://www.pg.com/en_ZA/news-views/pressrelease/keeping-girls-in-school-always.shtml.

(2015). Production of go! pads in Ngoma, Rwanda | SHE.

Aniebue, U. U., et al. (2009). "The impact of pre-menarcheal training on menstrual practices and hygiene of Nigerian." Pan African Medical Journal: 9.

Callahan, R. R., Kate; Wilson, Lucy (2015). "Common cause: Linking menstrual hygiene management and long-acting contraception to improve youth reproductive health." Retrieved 08/05/2016, 2016, from http://www.twigh.org/twigh-blog-archives/2015/5/28/common-cause-linking-menstrual-hygiene-management-and-long-acting-contraception-to-improve-youth-reproductive-health.

Crofts, T. and J. Fisher (2012). "Menstrual hygiene in Ugandan schools: an investigation of low-cost sanitary pads." Journal of Water Sanitation and Hygiene for Development 2(1): 50-58.

Dolan, C. S., et al. (2014). "A blind spot in girls'education: menarche and its webs of exclusion in ghana." Journal of International Development 26(5): 643-657.

DS, D. and G. CH (2005). "Perceptions and practices regarding menstruation. A comparative study in urban and rural adolescent girls." Indian Journal of Community Medicine: 2.

Garg, R., et al. (2012). "India moves towards menstrual hygiene: subsidized sanitary napkins for rural adolescent girls—issues and challenges." Maternal and child health journal **16**(4): 767-774.

Glasier, A. F., et al. (2003). "Amenorrhea associated with contraception—an international study on acceptability." Contraception **67**(1): 1-8.

Hannoun, A. B., et al. (2007). "Effect of war on the menstrual cycle." Obstetrics & Gynecology **109**(4): 929-932.

Hayden, T. (2012). Menstrual hygiene management in emergencies: Taking stock of support from UNICEF and partners, UNICEF and RedR Australia, New York.

Hennegan, J. and P. Montgomery (2016). "Do Menstrual Hygiene Management Interventions Improve Education and Psychosocial Outcomes for Women and Girls in Low and Middle Income Countries? A Systematic Review." PloS one 11(2): e0146985.

House, S., et al. (2012). "Menstrual Hygiene Matters: A resource for improving menstrual." 354.

Innovations, C. f. E. "Always Keeping Girls in School." Retrieved 09/06/2016, 2016, from http://www.educationinnovations.org/program/always-keeping-girls-school.

Johnson, J. (2016) Our Community Work in Bangladesh.

Johnston-Robledo, I., et al. (2003). "To bleed or not to bleed: Young women's attitudes toward menstrual suppression." Women & Health **38**(3): 59-75.

Kjellén, M., et al. (2012). "Global review of sanitation system trends and interactions with menstrual management practices." Stockholm, Sweden: Stockholm Environment Institute.

Mahon, Therese, Fernandes, Maria. "Menstrual Hygiene in South Asia: a neglected issue for WASH (water, sanitation and hygiene) programmes". Gender and Development. (2010). Vol. 18 No.1.

McMahon, S. A., et al. (2011). "'The girl with her period is the one to hang her head' Reflections on menstrual management among schoolgirls in rural Kenya." BMC International Health & Human Rights: 1-10.

Miller, M. (2015). An Innovative Solution To Menstrual Hygiene In Developing Countries. FastCo Design. 2016.

Millington, K. A. and L. Bolton (2015). "Improving access to menstrual hygiene products."

Oster, E. and R. Thornton (2011). "Menstruation, sanitary products, and school attendance: Evidence from a randomized evaluation." American Economic Journal: Applied Economics 3(1): 91-100.

Oster, E. and R. Thornton (2012). "Determinants of technology adoption: Peer effects in menstrual cup take-up." Journal of the European Economic Association 10(6): 1263-1293.

Pillitteri, S. P. (2011). "School menstrual hygiene management in Malawi: More than toilets."

Sahin, M., et al. (2015). "Adolescent schoolgirls' experiences of menstrual cups and pads in rural western Kenya: a qualitative study." Waterlines 34(1): 15-30.

Sahin, M., et al. (2015). "Learning, acting, and learning (LAL) research on schools' menstrual hygiene management (MHM): Pakistan." Waterlines 34(1): 103-112.

Sommer, M. (2010). "Putting menstrual hygiene management on to the school water and sanitation agenda." Waterlines **29**(4): 268-278.

Sommer, Mami, etc. “Comfortably, Safely, and Without Shame: Defining Menstrual Hygiene Management as a Public Health Issue”. American Journal of Public Health. (2015). 105:7.

Sommer, M. (2012). "Menstrual hygiene management in humanitarian emergencies: gaps and recommendations." Waterlines 31(1-2): 83-104.

Sommer, M., et al. (2016). "Managing menstruation in the workplace: an overlooked issue in low- and middle-income countries." International Journal for Equity in Health **15**: 86.

Sumpter, C. and B. Torondel (2013). "A Systematic Review of the Health and Social Effects of." PLoS ONE: 15.

Tamiru, S. "Girls in Control: Compiled Findings from Studies on Menstrual Hygiene Management of Schoolgirls."

Tegegne, T. K. and M. M. Sisay (2014). "Menstrual hygiene management and school and school absenteeism among female adolescent students in Northeast Ethiopia." BMC Public Health: 14.

The Hague, Dutch Water Sector, SWA Delegation. “Menstrual Hygiene Management Project: Menstrual hygiene management in Ugandan schools (2012-2014)”. http://simavi.org/wp-content/uploads/2015/03/WASH-Event-Case-Menstrual-Hygiene-Management.pdf

The Netherlands Development Organization (SNV), IRC International Water and Sanitation Centre. “Study on menstrual management in Uganda: Results”. (2012).

Tracy, J., et al. (2016). "Menstrual issues for women with intellectual disability." Australian Prescriber **39**(2).

Unilever Sustainable Living Young Entrepreneur Awards in 2014. Project: “Paschim Paaila” Marching towards Menstrual Hygiene Management in Rural Nepal (2009-) http://paschim-paaila.blogspot.com/

WaterAid. “'Global Cause' and Effect: How The Aid System is Undermining the Millennium Development Goals”. WaterAid. (2007).

Water For People India, Sanhita Gender Resource Center. “Exploring Menstrual Hygiene Management in Schools: Research tools for exploratory studies”. West Bengal, India. MHM Virtual Conference 2013. http://docplayer.net/14815529-Exploring-menstrual-hygiene-management-in-schools.html

Wilson, E., et al. (2012). "INSPIRES: Investigating a reusable sanitary pad intervention in a rural educational setting-evaluating the acceptability and short term effect of teaching Kenyan school girls to make reusable sanitary towels on absenteeism and other daily activities: a partial preference parallel group, cluster randomised control trial."

WSCC, UN Women "Study: menstrual hygiene management: Behavior and Practices in the Kedougou Region, Senegal". (2015)
http://wsscc.org/wpcontent/uploads/2015/05/kedougou_study_en_lores.pdf