

Distribution Agreement

In presenting this thesis or dissertation as a partial fulfillment of the requirements for an advanced degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis or dissertation in whole or in part in all forms of media, now or hereafter known, including display on the world wide web. I understand that I may select some access restrictions as part of the online submission of this thesis or dissertation. I retain all ownership rights to the copyright of the thesis or dissertation. I also retain the right to use in future works all or part of this thesis or dissertation.

Signature:

Candace Alethea Girod

Date

Heart Friends, Pad Boxes, and 'Bread':
The social ecology of girls' menstruation in two Nairobi slums

By

Candace Alethea Girod
Master of Public Health

Global Health

_____ [Chair's signature]
Matthew Freeman
Committee Chair

_____ [Member's signature]
Anna Ellis
Committee Member

_____ [Member's signature]
Bethany Caruso
Committee Member

_____ [Member's signature]
Karen Andes
Committee Member

Heart Friends, Pad Boxes, and 'Bread':
The social ecology of girls' menstruation in two Nairobi slums

By

Candace Alethea Girod

B.A.
Washington University in St. Louis
2011

Thesis Committee Chair: Matthew Freeman, PhD MPH

An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in Global Health
2016

Abstract

Heart Friends, Pad Boxes, and 'Bread':
The social ecology of girls' menstruation in two Nairobi slums

By Candace Alethea Girod

There is a great deal of research on menstrual hygiene in Kenya, compared to other countries in Sub-Saharan Africa. However, very little research has been conducted on menstrual hygiene in urban slums. The Kenyan government created a new policy providing menstrual pads to public schools in low resource areas, but few studies document the difference between girls' experience of menstruation at public schools with government pad provision compared to private schools without it. We conducted qualitative research with girls and teachers in two Nairobi slums to understand the factors influencing girls' experience of menstruation at school. We found that public schools had more WASH facilities available, but access was not equitable across the student body. Individual, social, physical, and societal factors influenced girls' ability to manage their menstruation at school. Key findings included that Muslim students practicing ablution were unable to use certain toilets at both public and private schools, and teachers used language that encouraged gender inequality for girls. Targeted data collection focusing on specific segments of school populations that may be neglected is necessary to create a complete depiction of access. Furthermore, implementers must devise new programs incorporating menarche into sexual and reproductive health curricula encouraging gender equity.

Heart Friends, Pad Boxes, and 'Bread':
The social ecology of girls' menstruation in two Nairobi slums

By

Candace Alethea Girod

B.A.
Washington University in St. Louis
2011

Thesis Committee Chair: Matthew Freeman, PhD

A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in Global Health
2016

Acknowledgements

First and foremost, I would like to thank the girls and teachers who participated in my research. Their candidness, willingness to be vulnerable, and the time they spent talking to me at the end of long school days made my project possible.

I would also like to thank the Sanergy team. Rose Nyawira was my advocate throughout my practicum experience and made sure that I was able to reach all of the schools I needed to. She also provided invaluable insight into the political systems and the NGO network operating in Nairobi. Patrick Mutuku took time out of his already busy days to take me to a number of schools, and helped me understand Mathare and Mukuru as well as Nairobi life more generally. Patrick also spent hours translating Sheng to English from my interviews, focus groups, and observations. Carlette Jantai and Jane Kaara were fantastic research assistants who provided feedback on the research tools and helpful commentary on the research activities. Ruthie Rosenberg was instrumental in helping me shape my preliminary findings for Sanergy and offering moral support throughout my practicum. Sanergy provided a wonderful environment for me to live in Nairobi and conduct this research project. The Sanergy Fellows program provided stability to my summer, and my time with Houriiya Tegally, Julia Jenjezwa, Linda Cheung, and Subhadra Banda was a transformative experience. I hope to have more experiences in which I am able to work with so many talented women of color. Finally I would like to thank, Eugene and Rose Gangarosa for providing funding for a great deal of my Global Field Experience.

Matthew Freeman not only created my practicum experience, but his research grant funded a large portion of my costs over the summer. He advocated for my project goals and guided my initial interactions with Sanergy. Without his financial and academic support, it would have been significantly more difficult to complete my research.

Karen Andes took me under her wing soon after I decided to come to Emory and she was an amazing friend and mentor throughout my analysis and writing process. Her Qualitative Data Analysis course gave me the tools to analyze my data, and her monthly meetings helped to shape my analysis process. Her advice to “just keep swimming, swimming, swimming” (Dory, 2013) got me through some very long days.

Anna Ellis provided boundless moral support throughout my entire research experience. She helped edit my GFE, called me on a weekly basis while I was in Nairobi and while I wrote my thesis, in addition to all of her help and support with editing and commenting on my thesis. She made the first sweep of every draft of my writing and helped me to solidify the direction of the research. Her friendship and encouragement was vital to my research process.

Bethany Caruso was the reason I came to Emory. As a Peace Corps Volunteer in Uganda, I emailed her out of the blue to ask questions about her MHM research, and she kindly answered all of my questions and provided me with resources for learning more. Her energy,

enthusiasm, and intellect is truly inspiring to me, and my MPH experience would not have been the same without her. Bethany's flexibility and accessibility in the last few weeks before my due date helped me bring all of my nebulous thoughts about the data together. Her guidance, mentorship and commitment to detail helped me throughout my time at Emory.

Marni Sommer e-introduced me to Bethany and was the first researcher I spoke to about MHM. Correspondence with her throughout my Peace Corps and graduate school experience has been incredibly encouraging. I am grateful for her kindness, as well as her willingness to share resources and to be a source for support.

Finally I would like to thank my friends and family for their unending support. My mother has been my biggest cheerleader since I can remember, and her wisdom and ability to say the exact right thing never ceases to amaze me. Jake Carpenter, my partner and the impetus for my MHM pursuits ("Oh Candy, why don't you do something with that box of reusable pads Kayla left behind") has been my rock both personally and academically. Jessica Goza is the most caring person I know, and she made sure that I stayed healthy over the past year. Kate Scully knows my life. We have traversed this thesis experience together and she has kept me going with her humor and her strength.

in memoriam Boaz Ngabirano, my Peace Corps counterpart, and the most hardworking, selfless person I've ever known. He was my MHM champion, and he touched the lives of countless women in Southwestern Uganda.

Table of Contents

Chapter 1: Introduction	1
Problem Statement	2
Research Objective.....	2
Purpose and Significance Statement.....	3
Chapter 2: Literature Review	4
Importance of Adolescence	4
<i>School Settings and Gender.....</i>	<i>5</i>
<i>Menstrual Hygiene Challenges.....</i>	<i>7</i>
<i>Menstrual Hygiene and Religion</i>	<i>12</i>
<i>Menstrual Hygiene in Slums.....</i>	<i>12</i>
<i>Menstrual Hygiene in Kenya.....</i>	<i>13</i>
<i>WASH and Education in Nairobi Slums.....</i>	<i>16</i>
<i>Menstrual Hygiene in Nairobi Slums</i>	<i>18</i>
Conclusion	18
Chapter 3: Manuscript	20
Contribution of Student	21
Abstract	22
Introduction.....	23
Methods	26
<i>Study Setting</i>	<i>26</i>
<i>School Selection.....</i>	<i>27</i>
<i>Research activities.....</i>	<i>28</i>
<i>Data Collection and preparation</i>	<i>30</i>
<i>Analysis.....</i>	<i>31</i>
<i>Ethics</i>	<i>31</i>
Results	32
Socio-ecological Model for Girls Experience of Menstruation at School.....	34
Individual Factors	35
<i>Social Environment.....</i>	<i>39</i>
Physical Environment.....	42
<i>Societal Factors</i>	<i>44</i>
Chapter 4: Conclusion and Recommendations	56
Appendices	68
Appendix A: Key Informant Interview	68
Appendix B: Focus Groups Discussion Guide	76
Appendix C: School Facility Observation.....	80

Chapter 1: Introduction

Menstruation is an integral part of puberty and signifies a transition into womanhood for girls across the world. However, many girls reach menarche when they are confused about what is happening to their bodies. Fear, shame and stigma may prevent these girls from reaching out to peers, teachers, or family to get help, and they may not have sources for accurate information and support as they move through this time of great change. Furthermore, girls may be unable to access the facilities and financial resources to comfortably manage their menstruation at school due to low socio-economic status or schools with low resources.

A girls' ability to manage menstruation competently and with self-confidence in early adolescence is important for her overall health and well-being. It makes her more likely to exercise agency in sexual relationships later in life and maintain her reproductive health throughout the life course. (Sommer et al., 2015b). Girls often begin menstruating at the point in their schooling when they begin to drop out, and an inability to manage menstruation may contribute to school dropout (Montgomery et al., 2012). When girls are able to manage menstruation at school, they are better able to concentrate in class and less likely to be absent, giving them more access to education (House et al., 2012; Mason et al., 2015; McMahon et al., 2011; Montgomery et al., 2012). Higher levels of education are associated with improved health outcomes for women as well as their children (Viner et al., 2012). Women who complete secondary school are better able to manage fertility, have more agency to make decisions, and have higher levels of economic productivity (Odaga & Heneveld, 1995; Viner et al., 2012).

Problem Statement

There is a great deal of research on menstrual hygiene in Kenya, compared to other countries in Sub-Saharan Africa. However, very little research has been conducted on menstrual hygiene in urban slums globally, and even less in Kenya specifically (Crichton et al., 2013). Kenya's newest educational reforms include policies adding pad provision to public schools in very low resource areas (Sharif et al., 2010), but there are no published studies documenting the difference between girls' experiences at public schools with government pad provision compared to private schools without it. It is essential to understand how various levels of influence have an impact on girls' ability to manage menstruation at school.

Research Objective

The objective of this research was to gain understanding of the experiences of girls managing menstruation in slums at public and private schools in Nairobi, Kenya. The original purpose of the research was to inform menstrual hygiene programming for Sanergy, a social enterprise supplying urine diverting dry toilets. The activities used to do this included focus group discussions and anonymous question sessions with girls, key informant interviews with teachers, and structured facility observations on school grounds. However, the qualitative and quantitative data have been further analyzed to:

- 1) To understand girls' knowledge, attitudes, and practices surrounding menstruation at school;
- 2) To explore the social and physical aspects of girls' environment that influence girls' menstrual management at school;

- 3) To understand how Kenyan National WASH and education policies impact girls' experience of menstruation at school.

Purpose and Significance Statement

The purpose of this thesis is to characterize the individual, social, physical and societal environment in which girls experience menstruation at slum schools and highlight opportunities for improvement in girls' menstrual hygiene management programming in Kenyan slums. This study will contribute to a more holistic understanding of girls' menstruation experiences in school settings.

Chapter 2: Literature Review

Importance of Adolescence

There are 1.8 billion young people between 10 and 24 years old in the world today, and almost ninety percent of them live in developing countries (Das Gupta et al., 2014). Biological realities, personal relationships, and structural determinants such as patriarchy (Dobash & Dobash, 1979), political and economic systems, access to health services, migration and education have a great influence on adolescent health and development (Blum et al., 2012; Viner et al., 2012). While behaviors and risk factors for poor health in adulthood are developed in adolescence, public health has focused significantly less on adolescent health, with more emphasis on early childhood and older adults (Patton et al., 2009). Adolescent health research and programming has progressed far more slowly when compared to child health over the last 50 years (Sawyer et al., 2012). Outside of high income countries, there is little understanding of adolescence, and a great deal of knowledge is related specifically to reproductive health in adolescents over the age of 15 (Blum et al., 2012). However, the body of research is growing on children in early adolescence, aged 10-14, in developing countries (Blum et al., 2012; Sommer, 2011).

Education is particularly salient during adolescence (Blum et al., 2012; Kabiru et al., 2013). Higher levels of education are associated with improved health outcomes for women as well as their children (Viner et al., 2012). Women who complete secondary school are better able to manage fertility and have more agency to make better decisions for their lives (Viner et al., 2012). Increased education for women also increases agricultural and economic productivity for women and their families (Odaga & Heneveld, 1995). Similar research has not been

conducted for men, so the association between boys' education and health outcomes for their children is still unclear (Sawyer et al., 2012).

School Settings and Gender

Schools provide environments for academic achievement and they are a site for social and emotional growth. Primary schooling is a way to reach large numbers of children with uniform health messaging because large numbers of children attend school (UNESCO, 2015). Nevertheless, there are still 58 million school aged children that are out of school and must be reached through community based interventions instead (Sommer, 2010b). Primary schools can be a conducive environment for implementing health interventions (Kaaya et al., 2002; Paul-Ebhohimhen et al., 2008), however simply completing primary and secondary school is associated with more positive health outcomes than specific school health interventions (Hargreaves et al., 2008). Children must feel connected to their teachers (Fatusi & Hindin, 2010) and receive gender equitable education (Marmot et al., 2008) in order for them to stay in school and lower early sex, violence, and substance abuse (Cunningham et al., 2008; Viner et al., 2012).

While school enrollment has improved, it is not indicative of gender equity in classrooms. In the last twenty years, primary school enrollment has increased by 20 percentage points in 11 countries in Sub-Saharan Africa and 17 countries globally (UNESCO, 2015). Countries have increased the number of children in school and decreased the gender disparity in school enrollment. Between 1999 and 2012, the number of countries with gender parity indices lower than 0.9 dropped from 33 to 16 (UNESCO, 2015). The reduced disparity in school

enrollment between boys and girls does not necessarily mean that there is gender equity in school (Thomas & Rugambwa, 2013). In Tanzania, one study of a classroom with equal numbers of girls and boys found that teachers said they wanted to engage male and female students equally. During some classes teachers encouraged both girls and boys to participate equally, but during others, the teacher did not ask girls to speak in class at all, illuminating a disconnect between stated philosophies and executed objectives (Thomas & Rugambwa, 2013).

It is difficult to introduce more nuanced practices of gender sensitivity into schools, especially in low income settings (Brown, 2007). In primary school, teachers' beliefs about gender norms are the primary indicator for whether or not students will learn gender stereotypes in school, and teachers reinforce predominant gender norms in their classrooms (O-saki & Agu, 2002). In one school, boys were asked to pick up wastepaper in the classroom, which would benefit the entire class. Conversely, girls were asked to perform chores specifically benefiting their teachers, like cooking food or cleaning their homes, reinforcing gender norms (O-saki & Agu, 2002). Girls were also asked easy questions because of an underestimation of their intelligence (Thomas & Rugambwa, 2013; Unterhalter & Aikman, 2007). Similarly, teachers used examples in class that reinforced gender norms, such as emphasizing the larger cultural belief that girls must be pretty and men must be strong and aggressive (O-saki & Agu, 2002; Thomas & Rugambwa, 2013; Unterhalter & Aikman, 2007). Schools have the capacity to rectify oppressive gender norms, but they are often reinforced (Sommer, 2013).

Menstrual Hygiene Challenges

Over the last fifteen years, studies regarding menstrual hygiene have focused primarily on girls in school settings. The primary topics addressed are: school sanitation, materials for menstruation management, accessing information, and impacts on social and emotional health.

School Sanitation

Studies in Tanzania, Kenya, India and Malawi show that girls want access to adequate water, latrines and disposal mechanisms when they menstruate (Mahon & Fernandes, 2010; Pillitteri, 2011; Sommer, 2013). Girls face challenges due to the inadequate number of toilets and time periods when they may use school facilities. Teachers may only allow students to use the toilet during break times, and because there is an inadequate number of toilets, lines are long and girls feel rushed (Caruso et al., 2014; Haver et al., 2012; Oduor et al., 2015; Sommer, 2010a; Wambugu & Kyalo, 2014). In Western Kenya, girls were found to mistakenly drop their sanitary pads, menstrual cups, and cloths for absorbing menstrual blood on the floor of the latrine more often at schools with student to toilet ratios higher than the national guideline (Oduor et al., 2015). Girls had anxiety about peers discovering that they are menstruating when blood dripped on the toilet and they had no way to clean it, a problem exacerbated by high pupil to toilet ratios (Crichton et al., 2013; Sommer, 2009). The 2010 Kenyan National Guidelines state that the pupil to toilet ratio should be 25:1 for girls and 35:1 for boys (Kenya Ministry of Education, 2010), but a number of schools in Kenya had ratios that were significantly higher (Njue & Muthaa, 2015; Sommer, 2009). When a school does not have the appropriate number of toilets, defined by a ratio of 1 toilet for every 25 girls and 1 toilet and 1 urinal for every 50 boys (Adams et al., 2009), they tend to practice more open defecation

(UNICEF, 2010). When schools in one study increased the number of toilets in the compound, the enrollment levels for girls increased (Garn et al., 2013). This may be because girls want to have a private place to manage their menstruation in order to feel comfortable at school (Sommer, 2010a).

Toilet cleanliness and disposal is a concern for girls menstruating at school and for the environment. One study in Western Kenya demonstrated that girls were less likely to use toilets when they were dirty (Garn et al., 2014). Another Kenyan study showed that girls felt embarrassed when they did not have waste bins in which to put their pads, especially when there was a possibility that others would see their used pads (Crichton et al., 2013). This was also true in Tanzania, India, Nepal and Egypt (El-Gilany et al., 2005; Mahon & Fernandes, 2010; Sommer, 2013; Thakre et al., 2011). In Uganda, Sierra Leone, Kenya and Tanzania, girls report throwing their used sanitary pads into pit latrines (Caruso et al., 2013a; Crofts & Fisher, 2012; Long et al., 2013; Oduor et al., 2015; Sommer, 2013). In addition to causing the latrines to fill too quickly (Crofts & Fisher, 2012), menstrual pads often contain dioxins that can leach into the soil (Oduor et al., 2015), accumulate in the food chain and cause cancer or developmental defects (WHO, 2014). More research is necessary to understand the interplay between menstrual waste and sanitation systems (Sommer & Sahin, 2013), as well as the possible health effects of using menstrual pads that contain harmful chemicals (Bobel, 2010).

School toilets may be a hindrance for girls if they do not have functional doors and access to water (Sommer, 2010a). The absence of toilet doors or locks on doors has been described in numerous countries, and deprives students of basic dignity (R. Garg et al., 2012; House et al., 2012; Naeem et al., 2015; Sommer & Sahin, 2013; Sumpter & Torondel, 2013). This

leaves girls fearful that someone will open the door on them or that someone could take advantage of them when they're using the toilet facilities (Crofts & Fisher, 2012; Sommer, 2009). In numerous countries such as Kenya and Tanzania, girls reported needing water to wash bloody menstrual cloths, wash menstrual blood from their hands, or clean their hands before changing their sanitary materials (Caruso et al., 2013a; Nyothach et al., 2015; Sahin, 2015; Sommer & Sahin, 2013). Schools may have water points near the toilet facilities, but if they are not private, girls still feel ashamed or embarrassed to use them (Sommer & Sahin, 2013). Privacy and security are necessary components to an environment where girls feel comfortable managing menstruation (UNESCO, 2014).

Materials for Menstruation Management

The lack of materials to manage menstruation contributes to a decrease in class participation for girls. Girls often lack access to absorbent materials for menstrual blood such as disposable sanitary pads, reusable cloths, and toilet paper, which girls may use when they do not have other options (Crofts & Fisher, 2012; Mason et al., 2015; Montgomery et al., 2012; Sahin, 2015; Sommer, 2010a). Studies from numerous countries including Kenya, India, and Ghana, establish that girls are fearful of staining their clothes with menstrual blood (Crichton et al., 2013; Joshi et al., 2015; Mahon et al., 2015). In Kenya, girls described behaving differently in class—sitting in the back of the room until everyone else leaves, only standing, and wearing additional layers of clothing to prevent leakage (McMahon et al., 2011). Girls in Kenya also reported being unable to concentrate in class because they were constantly worried about leaking onto their uniforms (McMahon et al., 2011; Nyothach et al., 2015; Wambugu & Kyalo,

2014). Although fear of leaking may not necessarily cause girls to be absent from school, it may lower their general performance (Sahin, 2015).

Accessing Information

Access to accurate information regarding menstruation helps girls manage their period confidently, but it is not always available (House et al., 2012). Teachers are the primary source of information regarding menstruation in countries such as Ghana, Ethiopia, and Bangladesh (Dorgbetor & Sahin, 2015; Gultie et al., 2014; Nahar & Ahmed, 2006), while mothers may be the primary source in places such as Nigeria (Irinoye et al., 2002). However, teachers do not always present correct information (Crichton et al., 2013; Long et al., 2013; Sommer, 2013). In Tanzania, teachers told their students that their mothers would die if someone saw their used sanitary pads. They said this to keep girls from improperly disposing of their pads (Sommer, 2009). Other studies demonstrate that while teachers have access to the resources they need, such as lesson plans and educational materials, they may be too shy to present that information to their students. In Tanzania, India, Bolivia, and the Philippines, studies indicated that teachers saw reproductive health education as shameful and embarrassing (R. Garg et al., 2012; Haver et al., 2012; Long et al., 2013; Sommer, 2009). These issues illustrate a need for creating standardized, context specific curricula around menstruation and focused programs to encourage teachers to use them in schools (El-Gilany et al., 2005; R. Garg et al., 2012; Sommer, 2009).

Peers are also a source of support and information for girls. Studies from India and Tanzania report that girls spoke to friends about menstruation before they approached their mothers (Dhingra et al., 2009; S. Garg et al., 2001; Sommer, 2009). Girls receive support from

their friends in the form of knowledge translation or psychosocial care when menstruating at school (Crichton et al., 2013; Mahon & Fernandes, 2010). Female peers may also be a source for fear and shame at school. Sommer (2010b) mentions that girls may use knowledge that a peer is menstruating against her. Another study from Kenya asserts that girls did not talk to their friends about menstruating because a friend may gossip about it or think that any approach is an appeal for money to purchase sanitary pads (McMahon et al., 2011).

Physical, Social and Emotional Impacts of Menstruation

Insufficient education and lack of material resources and facilities to manage menstruation have a variety of physical and emotional effects on girls (Crichton et al., 2013). Girls reported feeling pain when they were menstruating and missing school as a result. (Adinma & Adinma, 2009; Ekong, 2015; El-Gilany et al., 2005; Jones & Finlay, 2001; Moawed, 2001; Montgomery et al., 2012). In Saudi Arabia, girls had the resources and opportunity to purchase pain medication (Moawed, 2001), but this is often not the case (Crofts & Fisher, 2012). Sumpter and Torondel (2013) point out that while studies discuss missing school due to pain from menstruating, there are no studies that document the effect of providing pain medication.

Populations in countries such as India and Kenya believe that menstruation is connected to larger issues of sex and reproductive health (S. Garg et al., 2001; Mason et al., 2013). In Kenya, teachers explained that menstruation is the beginning of a girl's sexual status (McMahon et al., 2011). In Ghana, menarche is seen as a rite of passage, after which girls can be married (Joshi et al., 2015). Even in the absence of such belief structures, menstruation is

often conflated with sexual maturity and girls feel more vulnerable to unwanted male attention (Joshi et al., 2015; Sommer, 2013).

Menstrual Hygiene and Religion

While there are no prescribed hygiene practices in Christianity (Guterman et al., 2008; House et al., 2012), there are a number of practices related to hygiene in Islam. Both men and women must clean their genitals with water after defecation (Al-Sheikh, 1996). Women and girls are required to wash external genitals after urination or defecation. During menstruation women can wear either a clean cloth or a sanitary napkin, and women must perform a ritual washing before they can resume religious practices (R. Garg et al., 2012; Guterman et al., 2008). Muslim girls and women are forbidden from entering religious spaces, touching religious texts, saying their traditional prayers and having sex when menstruating (Guterman et al., 2008; Kumar & Srivastava, 2011). While studies discuss taboos and restrictions regarding menstruation and Islam (R. Garg et al., 2012; Kumar & Srivastava, 2011), very few studies examine differences in menstrual management for girls who follow Islamic law regarding hygiene. However, one study from Tanzania stated that Muslim women were more likely to cleanse their vaginas than Christian women (Allen et al., 2010).

Menstrual Hygiene in Slums

Few studies discuss differences between urban and rural experiences of menstrual hygiene at school, and even fewer studies discuss menstrual hygiene in slums. Studies in India and Nigeria compared urban schools to rural schools and examined experiences related to

menstruation (Ekong, 2015; Thakre et al., 2012). These results are limited in scope because there was no attention paid to issues of access to sanitation at school or socio-economic status of the participants. Sommer (2010b) outlines the primary differences between rural and urban settings in Tanzania: urban schools tend to have a narrower gender gap, water/sanitation issues and distance to school is less likely to be a problem and influences of modernization may be greater in urban environments (Sommer, 2009). While these issues are salient to urban areas, they are not necessarily true in slums. In slums, socio-economic status, education levels, and sanitation situations tend to be worse than other parts of a given city (Joshi et al., 2011). Menstrual hygiene in slums is an emerging area of study, with few published articles thus far. One study of married women in Delhi, India found that menstrual hygiene practices such as disposal for women who live in slums were fairly similar to those of women living in other parts of India (S. Garg et al., 2001). Contrary to rural settings where girls may go home to have a private space when managing menstrual flow, privacy at home was one of the largest concerns for women in slums. This difference was primarily due to the proximity within which residents live to each other. Participants tried to avoid the gaze of neighbors while they washed their menstrual cloths, so they buried their cloths instead. However, burying was also problematic for participants because they believed that neighbors could cause them to be infertile by cursing their buried cloths (S. Garg et al., 2001).

Menstrual Hygiene in Kenya

In 2003, the Kenyan government instituted Free Primary School education to give low-income children better opportunities to enroll in school (Republic of Kenya Ministry of

Education, 2015). This increased enrollment by 13 percent within the first year, but enrollment increased by 54% for boys and only 48% for girls (Njue & Muthaa, 2015). While enrollment increased for both boys and girls, a study examining the effects of Free Primary Education between 1997 and 2007 found that the percentage of girls graduating decreased by 2% during that time (Lucas & Mbiti, 2012). Since 2007, the Kenyan government has created a number of policies to address gender equity in schools. The Kenyan government instituted Free Day Secondary School in 2008, though families are still responsible for paying fees for exams, lunch, and uniforms (Republic of Kenya Ministry of Education, 2015). Through partnerships with NGOs such as UNICEF, the government also offers scholarships to girls and other vulnerable children who may not be able to pay the fees. Other policies to improve gender equity include readmitting girls who were forced to drop out due to pregnancy or marriage and adding a life skills component to the curriculum to address early marriage, sex, child labor and female genital mutilation (Republic of Kenya Ministry of Education, 2015).

While there is no gender disparity in Kenya where the a gender parity index or GPI is 1.01, the GPI for graduation is lower, at .96 (Republic of Kenya Ministry of Education, 2015). A portion of this discrepancy is attributable to poor sanitation in school (Njue & Muthaa, 2015). Poor sanitation affects all students, but it may have a greater effect on girls because they especially need facilities that are adequate for managing their menstruation (Sommer, 2010a). Kenya's School Health Strategy for sanitation refers specifically to menstruation and primary school girls (Sharif et al., 2010). This takes the form of provisions for sanitary pad distribution, improving the pupil to toilet ratio, and creating disposal mechanisms for sanitary pads at school (Sharif et al., 2010). The technical guidelines for school WASH specifies that each student

should have at least 5 liters of water per day, each block of toilets should have at least one water point, the pupil to toilet ratio for girls should be 25:1, and boys and girls toilets should be separate (Kenya Ministry of Education, 2010). However, as of 2013, the national average pupil to toilet ratio for girls was 45:1 (NTA, 2014). Whereas UNICEF recommends that toilet to student ratios should not go beyond 40:1 (UNICEF, 2010).

In 2012, Kenya's education policy put specific emphasis on menstruating girls in primary school (Republic of Kenya Ministry of Education, 2015). The Sanitary Towels Programme specifically targets girls living in arid and semi-arid areas, urban slums, and other high poverty areas. The Ministry of Education resolved to provide sanitary pads for girls in public primary schools in 2012 (Kilonzo, 2012). Kenya's 2011-2015 School Health Strategic Plan notes that the government plans to distribute a minimum of 2 packages of pads per girl (Sharif et al., 2010). The strategy does not give a specific time period for distribution, so this number could refer to the number of pads girls should receive in a year, a term, or a month.

Paulino and Thinguri reviewed the Sanitary Towel Program policy and observed the programs implementation in slums and other high poverty areas in Kenya, and cited a number of areas for improvement (2015). For example, there is unequal distribution of pads such that some girls receive more pads than they need while others do not receive any. There is no clear way to identify which girls should receive the pads, so girls who have the resources to buy their own pads may get pads from the government, while girls who do not have the resources to buy their own pads may not receive them. Additionally, there are delays in pad delivery and sometimes pads are only delivered once per year. Lack of coordination between the government and other organizations donating pads creates scenarios in which some schools

receive pads from multiple parties while others do not receive any. Only one teacher per school receives training in menstrual hygiene education from the government as part of this program. This can be problematic if the teacher is transferred. Finally, there are no mechanisms in place to monitor or evaluate the program, though the Education For All annual report claims that this is a priority (Paulino & Thinguri, 2015; Republic of Kenya Ministry of Education, 2015). The School Sanitary Towel Programme has the potential to be helpful for girls, but there are still major complications to its implementation.

WASH and Education in Nairobi Slums

Governments support the existence of poor conditions in slums by failing to provide public services, discouraging the provision of utilities, and creating zoning laws that prohibit slum residents from owning the land on which their homes are built (Martine, 2012; Satterthwaite & Mitlin, 2013). British colonialists designed Nairobi, Kenya's capital, to spatially segregate residents based on their race (Darkey & Kariuki, 2013). Black people were only allowed to live within the city as temporary laborers. This did not change after Kenya's independence in 1963 (Darkey & Kariuki, 2013). As of 2011, Kenya does not have urban land tenure legislation and all slums in Nairobi are officially illegal. (Joshi et al., 2011). Meanwhile, 3.2 million people, or 65% of the people living in Nairobi live in a slum (APHRC, 2014; Corburn & Hildebrand, 2015). Between 70 and 90% of slum dwellers are migrants and have worse health outcomes, compared to those born in Nairobi (Bocquier et al., 2011). The average stay in Nairobi slums decreased from 4 years in 2000 to two years in 2012, indicating that the slum population has become more migratory and unstable during that time. Kenya's DHS is not

helpful for finding health statistics about Nairobi's slums because it aggregates data from larger geographical regions, masking inequalities within the city (APHRC, 2014).

Compared to national averages, Nairobi slums tend to have higher percentages of people completing school, however when compared to urban areas, they are far lower. In Nairobi slums, 31% of residents completed primary school and 51% completed secondary school, compared to national averages of 27% completing primary school and 34% completing secondary school. However, the statistics in slums are far lower than the average for Nairobi, where 21.5% complete primary school and 68.1% complete secondary school (APHRC, 2014). These statistics do not speak to the quality of the schools or the level of education that children receive, which vary greatly (Satterthwaite & Mitlin, 2013). The Mathare slum, with at least 500,000 residents has only 4 public schools (Economist, 2015), despite the fact that public schools tend to be less expensive with better, more consistent resources (Satterthwaite & Mitlin, 2013).

While water and sanitation coverage is generally improving, projections show that slums will account for over 60% of the world's coverage gap within the next twenty years. Improvements in urban water and sanitation coverage tends to benefit wealthier parts of cities, increasing inequalities and public health risks (Uwejamomere & Northover, 2008). Seventy two percent of people in Nairobi slums have no access to piped water in their homes, compared to 22% in Nairobi as a whole (APHRC, 2014). Families in slums may pay 50 times more for water than those in wealthy parts of the city, with one 20 liter jerry can costing between \$0.03 and \$0.15 depending on the water supply (BBC, 2015; Crow & Odaba, 2010). In Mathare, one of the slums in Nairobi, 83% of residents share a toilet with neighbors and pay about \$.05 per use

(Corburn & Hildebrand, 2015). While use of shared toilets is popular, almost 70% of residents in Mathare also use “flying toilets”, a term used to describe defecating into a plastic bag and throwing it away (Corburn & Karanja, 2014).

Menstrual Hygiene in Nairobi Slums

There are a number of organizations conducting programming around menstrual hygiene in Nairobi slums, but few studies illustrate the experiences of girls and women in this setting. Crichton et al. (2013) echoes concerns about menstruation described around the world in their study of Nairobi slums. They asserted that challenges related to menstrual hygiene management include stigma, lack of knowledge, and lack of adequate materials to manage menstrual flow. While their study setting was a slum, they focused heavily on the universality of negative experiences related to menstruation in resource poor settings and did not discuss how slums might be unique. They emphasized psychosocial issues in great depth, but spent very little time discussing sanitation. Coburn however notes the importance of place and how political, environmental, and social issues intersect and influence women’s experiences of water and sanitation (Corburn & Hildebrand, 2015). After reviewing the literature, it is clear that more work must be done to understand the challenges specific to girls living in Nairobi slums.

Conclusion

Upon extensive review of the literature, it is evident that more work must be done to understand the challenges to girls living in slums as well as challenges related to religious

hygiene practices at school. Limited access to accurate information, and lack of adequate support from families, peers, and teachers further limits girls' ability to feel confident about their transition to adolescence. Girls have trouble managing menstruation at school because of an absence of water and sanitation facilities that create safe, private, and hygienic school environments. It is unclear how these factors affect girls living in slums. This research aims to illustrate the influence of cultural, political, and social environments on girls' experience of menstruation in school.

Chapter 3: Manuscript

Manuscript Title: Heart Friends, Pad Boxes, and 'Bread': The social ecology of girls' menstruation in two Nairobi slums

Authors:

Candace Alethea Girod

Anna Ellis

Karen Andes

Matthew C. Freeman

Bethany A. Caruso

Journal for First Submission:

The Journal of Water Sanitation and Hygiene for Development

Contribution of Student

Candace Alethea Girod modified the UNICEF tools used in the research, trained the research assistants, and collected the data. Girod also analyzed the data, and wrote the following manuscript. Anna Ellis provided advice on the research design, and analysis. She also made edits and comments on every draft in addition to supplying boundless support throughout the research, analysis, and writing process. Additionally, Ellis scheduled weekly or bi-weekly calls to discuss research progress, findings, and provide encouragement. Bethany Caruso provided advice during the data collection process, comments and edits during the drafting process, conceptualized Table 1 and Figure 1, provided invaluable insight on key concepts, and supplied additional resources about the socio-ecological model and MHM. Karen Andes supplied analysis guidance, assistance on presenting findings, comments and edits on drafts of the manuscript, as well as further insight into research in slums more broadly. Matthew Freeman conceptualized the initial idea for this research project, supplied advice for the research design, and provided comments and edits.

Abstract

There is a great deal of research on menstrual hygiene in Kenya, compared to other countries in Sub-Saharan Africa. However, very little research has been conducted on menstrual hygiene in urban slums. The Kenyan government created a new policy providing menstrual pads to public schools in low resource areas, but few studies document the difference between girls' experience of menstruation at public schools with government pad provision compared to private schools without it. We conducted qualitative research with girls and teachers in two Nairobi slums to understand the factors influencing girls' experience of menstruation at school. We found that public schools had more WASH facilities available, but access was not equitable across the student body. Individual, social, physical, and societal factors influenced girls' ability to manage their menstruation at school. Key findings included that Muslim students practicing ablution were unable to use certain toilets at both public and private schools, and teachers used language that encouraged gender inequality for girls. Targeted data collection focusing on specific segments of school populations that may be neglected is necessary to create a complete depiction of access. Furthermore, implementers must devise new programs incorporating menarche into sexual and reproductive health curricula encouraging gender equity.

Introduction

Menstruation is an integral part of puberty and signifies a transition into womanhood for girls across the world (Sommer, 2011). However, many girls reach menarche when they are confused about what is happening to their bodies (Fatusi & Hindin, 2010). Fear, shame and stigma may prevent these girls from reaching out to peers, teachers, or family to get help (Mason et al., 2013; McMahon et al., 2011), and they may not have sources for accurate information and support as they move through this time of great change (Sawyer et al., 2012; Sommer, 2013). Furthermore, girls may be unable to access the facilities and financial resources to comfortably manage their menstruation at school due to low socio-economic status or schools with low resources (Alexander et al., 2014; Crichton et al., 2013; McMahon et al., 2011; Nyothach et al., 2015; Oduor et al., 2015).

Adequate menstrual hygiene management has a number of positive health impacts. A girls' ability to manage menstruation competently, with self-confidence in early adolescence makes her more likely to exercise agency in sexual relationships later in life and maintain her reproductive health. (Sommer et al., 2015b). WASH conditions at school such as functional locks on doors, private access to water and disposal facilities, and clean toilets allow girls to manage their menstruation with dignity and without fear (Alexander et al., 2014; Caruso et al., 2014; Crofts & Fisher, 2012; R. Garg et al., 2012; Sommer, 2010a). When girls are able to manage menstruation at school, they are better able to concentrate in class and less likely to be absent, giving girls more access to education (House et al., 2012; Mason et al., 2015; McMahon et al., 2011; Montgomery et al., 2012). Higher levels of education are associated with improved health outcomes for women as well as their children (Viner et al., 2012). Women who complete

secondary school are better able to manage fertility, they have more agency to make decisions, and they have higher levels of economic productivity (Odaga & Heneveld, 1995; Viner et al., 2012).

The Kenyan government has improved educational opportunities for girls in recent years, however Kenyan school systems have not achieved gender parity (UNESCO, 2012). In 2003, the Kenyan government instituted Free Primary School education, which increased school enrollment by 13 percent within the first year, but enrollment increased by 54% for boys and only 48% for girls (Elimu Yetu Coalition, 2004; Njue & Muthaa, 2015). The Kenyan government proposed a new strategy in an effort to improve school enrollment for girls in 2010. Kenya's School Health Strategy for sanitation includes provisions for sanitary pad distribution, improving the pupil to toilet ratio, and creating disposal mechanisms for sanitary pads at school (Sharif et al., 2010). The technical guidelines for school WASH specifies that each toilet block should have at least one water point, the pupil to toilet ratio for girls should be 1:25, and boys and girls toilets should be separate (Kenya Ministry of Education, 2010). However, as of 2013, the national average pupil to toilet ratio for girls was 1:45 (NTA, 2014). While the government has made a great deal of progress, little is known about the specific impact on girls' ability to manage their menstruation in school.

There is a great deal of research on menstrual hygiene in Kenya, compared to other countries in Sub-Saharan Africa. However, very little research has been conducted on menstrual hygiene in urban slums globally or Kenya specifically (Crichton et al., 2013). Kenya's newest educational reforms include policies adding pad provision to public schools in very low resource areas (Sharif et al., 2010), but there are no published studies documenting the difference

between girls' experiences at public schools with government pad provision compared to private schools without it. It is essential to understand how various levels of influence have an impact on girls' ability to manage menstruation at school. Qualitative research in two slums in Nairobi was conducted to understand the how girls in public and private schools experience their physical and social environment based on the types of WASH facilities at school and their religious practices.

Methods

Study Setting

This study took place in the Mukuru and Mathare slums of Nairobi, Kenya. Thirty-two percent of the Kenyan population lives in an urban area and 84% of the population has completed at least some primary school (Kenya National Bureau of Statistics et al., 2015). In rural areas, the median number of years of schooling completed is 4.7 and in urban areas, it is 7.4 (Kenya National Bureau of Statistics et al., 2015). Twenty-four percent of households in urban areas have unimproved toilets, which do not hygienically separate excreta from human contact, while 64% of households in rural areas have unimproved sanitation facilities. Fifty percent of urban households use a shared toilet facility, while fifteen percent of rural households use a shared facility (Kenya National Bureau of Statistics et al., 2015).

The informal neighborhood Mukuru lies 10 kilometers southeast of Nairobi's city center and directly south of Nairobi's industrial area. The population of Mukuru is approximately 500,000 (Esper et al.). Mathare is the second largest slum in Nairobi with a population between 600,000 and 800,000 (Darkley & Kariuki). The average home in Mathare and Mukuru consists of one 10'x10' room that functions as a bedroom, living room, and in some cases, a kitchen. Household characteristics are far worse in Nairobi's slums compared to the city at an aggregated level. Sixty percent of households have access to public taps, twenty-eight percent of households have water piped into their residence, and eleven percent of households purchase their water from private companies. To compare, 14% of Nairobi residents have public tap access, 78% have water piped into their residence, and 3% buy water from private companies (APHRC, 2014). Ninety four percent of slum residents have access to a toilet, but as

many as 83% of residents rely on public shared toilets (APHRC, 2014; Corburn & Hildebrand, 2015).

This research was carried out in partnership with Sanergy, a for-profit sanitation social enterprise operating in informal settlements in Nairobi since 2011. Sanergy constructs modular toilets called “Fresh Life Toilets” (FLT) and sells them to franchised operators who charge a small fee for toilet use. FLT are usually located in public spaces, such as local markets (Esper et al., 2013). In 2014, Sanergy introduced FLT to schools in Mukuru, and six months later, to schools in Mathare.

Sanergy typically initiates partnerships with schools by inviting them to training sessions that focus on hygiene education and ways to improve sanitation at schools in slums. Sanergy’s trainers also conduct a demonstration showing how the FLT will improve the school’s sanitation. By attending the training, schools become affiliated with Sanergy, though they may not decide to acquire an FLT. If the school is interested in procuring an FLT, Sanergy assists them in finding a donor to purchase toilets. Schools usually procure between 3 and 5 toilets. This process may span several months.

School Selection

In consultation with the Sanergy staff, we purposively chose six Sanergy-affiliated schools based on the dominant religion of the pupils, toilet type, location, and whether or not the school was privately or publicly funded. Sanergy had little information about Muslim users, so understanding needs specific to this population compared with Christians was a priority. We selected three schools with FLT and three schools with pit latrines or flush toilets in order to

compare students' experience with Fresh Life to non-Fresh Life toilets. We chose schools in Mukuru and Mathare to understand possible differences based on the slum in which the school was located. The government distributes menstrual pads for students in public schools, but not in private schools, so we chose a mixture of public and private schools to compare girls' experiences based on formalized access to pads, type of toilet, and the primary religion of pupils.

Research activities

In order to understand the spectrum of factors influencing girls' experiences, at each school we conducted one focus group discussion (FGD) with girls, one key informant interview (KII) with Sanergy's contact person at the school, one facility observation, and one anonymous question session with girls. The study tools were adapted from UNICEF's 'WASH in Schools Empowers Girls' Education: Tools for Accessing Menstrual Hygiene Management in Schools' (Caruso et al., 2013b) which included key informant interview guides, school facility observation forms, and focus group discussion guides.

The primary purpose of the FGDs were to understand girls' challenges at school related to menstruation, and understand important characteristics of a toilet for girls who are menstruating. We conducted two primary activities. The first activity, called "The Ideal Place to Manage Your Period", asked participants to split into two groups and work together to draw pictures of toilet facilities or schoolrooms used for menstrual management. Then each group explained their drawing to the entire group. Next, in an activity called, "Imaging the Life of a Normal Girl," participants were asked to discuss a hypothetical situation in which a peer began

menstruating at school. Through this activity, girls were asked to speak generally about how their peers use the school's WASH facilities, describe their comfort with talking to teachers and other students about menstruation, and accessing money to buy pads. School administrators selected focus group participants based on willingness to participate, menarcheal status, and grade in school. Focus groups consisted of six to eleven girls who had already reached menarche and were between class six and eight.

The primary objective of the KIIs were to examine how menstrual hygiene education is conducted at school, understand teachers' perspective of student behavior with regard to menstrual hygiene, and gather general information about how the schools' water and sanitation facilities operate. One semi-structured key informant interview was conducted with Sanergy's primary contact person at each school, who was usually a teacher with a high rank, or a school administrator. KIIs consisted of a five page survey with multiple choice questions followed by an audio recorded section with open-ended questions about menstrual hygiene specific information.

We used the Facility Observation to document the water, sanitation and hygiene environment in which girls manage their menstruation at school. Next, we modified the UNICEF facilities observation guide and documented the adequacy of toilet facilities for menstrual management by assessing cleanliness, function, lighting, and level of privacy (Caruso et al., 2013b). In schools that employed a groundskeeper responsible for maintaining bathrooms, we toured the school facilities with that person. When this was not the case, the key informant observed the facilities along with the research team.

The purpose of the Anonymous Question Sessions were to understand what girls were uncertain about regarding menstruation, and answer their questions. It was informed by an approach similar to Sommer's work in countries such as Tanzania (Sommer, 2010a). During this activity, any female students in class 6-8 who were interested in asking questions about menstruation were allowed to stay after school, regardless of menarcheal status. Researchers gave each student a slip of paper and explained that they could write any questions they had about menstruation anonymously, then collected the paper slips with questions and answered them for at least an hour, or until girls were required to leave the school campus. Anonymous question sessions were added to the research activities after participants in the pilot school asked us to return so they could ask questions about menstruation.

Data Collection and preparation

We conducted all research activities in English and used an iPhone to record audio from the activities. Five out of six focus groups had a note-taker present, but the note-taker changed regularly. Note-takers were briefed on the purpose of the research, the basic goal of qualitative research, and types of information to collect in their notes, namely gestures and identification of the speakers. We transcribed audio recordings of interviews and focus groups. Sanergy staff were consulted for correct translations during the transcription process when students had made side comments in Sheng, a mixture of languages including English and Swahili spoken across Nairobi. Questions written by participants in the anonymous question sessions were typed into Microsoft Word and categorized by topic area and school.

Analysis

All transcripts were imported into MaxQDA version 11 (VERBI Software, Berlin), a data analysis software package that facilitates coding, organizing and retrieving data. Data analysis began with reading and writing memos in the transcripts to identify themes, and then define codes to represent those themes. After refining the definitions for each code, they were applied to the data. We then developed case studies for each school. Case studies consisted of a summary of all of the activities conducted at the school and a description of how details from each activity compared to each other. Creating case studies facilitated the triangulation of the data and understanding of the unique environment at each school. Next, we conducted a thematic analysis to understand overarching concepts in the data. To do this, we retrieved the text by theme, and created tables labeling the main ideas in each coded segment. Next, the segments were transferred to MAXMaps, a visual organization feature in MAXQDA, and we created idea webs based on common ideas, noting the associations and overlaps. Finally, the maps for each theme were synthesized into narrative form, adding nuance and depth to the associations.

Ethics

The research was deemed exempt by Emory University's Institutional Review Board. *In loco parentis* consent forms were signed by principals in each school for student participation, and informed verbal assent with all participants was obtained before each research activity. Confidentiality was maintained for every participant and all data has been de-identified.

Results

Data were collected at six schools in two Nairobi slums (See table 1). Data collection activities included six focus group discussions with girls in grade six to eight (43 total participants, 6-11 participants per group), six key informant interviews with teachers (2 male, 4 female), six school observations that examined water and sanitation facilities at the schools, and six anonymous question sessions (1 at each school; 19-150 participants per session). The schools represent a mixture of public and private, Muslim and Christian, and they had a variety of toilet facility types. The public schools had Fresh Life Toilets (FLT) in addition to traditional pour flush toilets. School administrators designated the FLT in these schools for girls in grades 6-8. The FLT in private schools were for all students.

Table 1. Descriptive statistics for schools in the study

	<i>Mean or #</i>	<i>Range or %</i>
Total # Schools	6	
Private	3	50%
Location		
Mukuru	3	50%
Mathare	3	50%
Population		
Total	604	(115-1054)
Public	976	(115-295)
Private	232	(902-1054)
Girls	314	(69-560)
Primary Religion*		
Muslim	2	33%
Christian	3	50%
Muslim and Christian	1	17%
Water Sanitation and Hygiene		
Pupil to Functional Latrine Ratio (Girls)		
Public	27:01:00	(24:1- 28:1)
Private	88:01:00	(47:1-147:1)
Pupil to Water point Ratio (Function/Total)		
Public	509:1/58:1	(97:1-902:1)/(47:1-75:1)
Private	232:1/168:1	(115:1-295:1)/(97:1-295:1)
Toilet Paper Present at LEAST Sometimes		
Public	3	100%
Private	2	67%
Private Dustbin in At LEAST 1 Stance		
Public	3	100%
Private	1	33%
Toilets Types		
Pour flush		
Public	3	100%
Private	1	33%
Fresh Life Toilets		
Public	2	67%
Private	1	33%
Pit Latrines		
Public	0	0%
Private	1	33%
Locks on Any doors		
Public	3	100%
Private	2	67%
Pad Provision		
Public	3	100%
Private	0	0%
Extra Uniforms		
Public	1	33%
Private	0	0%

*Based on Reports from Key Informants

Socio-ecological Model for Girls Experience of Menstruation at School

The socio-ecological model (DiClemente et al., 2005) (Figure 1) illustrates how factors at every level of analysis affect girls' experience of menstruation at school. Individual characteristics such as agency, access to cash, and personal knowledge are unique to each girl. The social environment, which includes relationships with peers and support from teachers have the most direct impact on girls' feelings of connectedness. The physical environment at school determines girls' ability to manage their menstruation at school. Societal influences such as policies and patriarchy create the atmosphere in which the other factors operate.

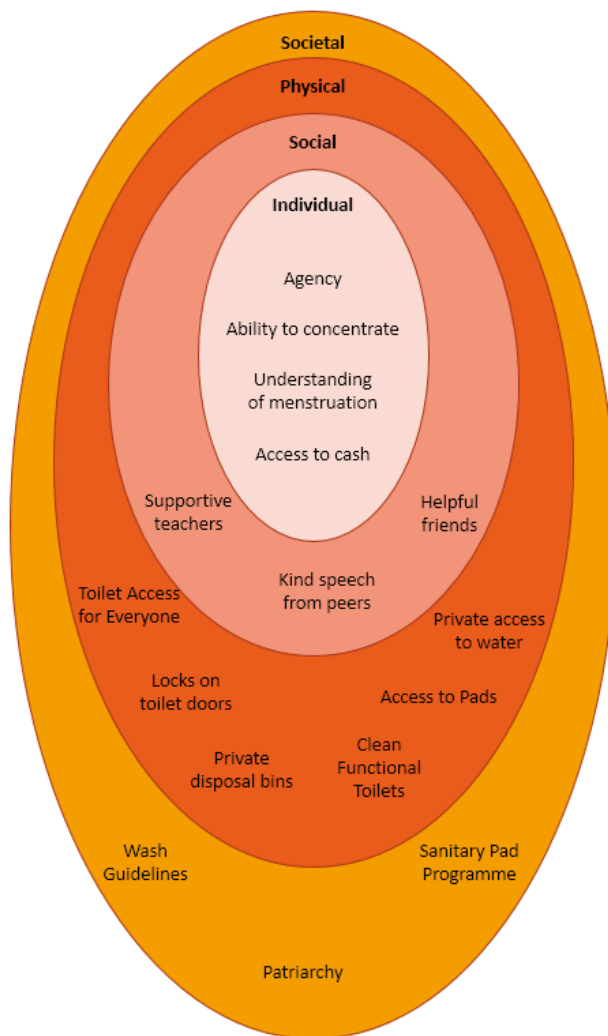


Figure 1 Socio-Ecological Model of Girls Experience of Menstruation at School

Individual Factors

Girls' understanding of menstruation and reproductive health, ability to ask for help and access to cash modified their attitudes toward menstruation at school.

Knowledge of Menstruation and Reproductive Health

At every school, girls were confused about menarche. During anonymous questions sessions they asked questions exhibiting their ignorance of menstruation such as, "How will I know when

I am menstruating?" Teachers at every school said they started teaching girls about menstruation only after they reached menarche, or beginning in grade six. In other words, teachers missed any girl who began menstruating before she reached grade six

You pick that one who has started the menstruation period so we take them with that group...Then the smaller ones, they are still tiny, they don't know what is happening. (Teacher, School 5, Public)

Girls reported that teachers explained menstrual hygiene coupled with warnings about not getting pregnant and/or not getting raped. As a result, girls had misinformation about the relationship between sex, pregnancy, and menstruation. For instance, in this quote, girls believed that they could get pregnant if they had sex during menstruation.

Girl 1: She'll just tell us that if you have your menstruation period, you have panties, for when you are going for period, and other ones for when you are not going for period. Then you wash yourself good and you nyowa (shave your pubic hair)

Girl 2: You stop playing with boys on your period.

Girl 1: On your period, you can get pregnant. (FGD, School 3, Private)

Infections were also a great concern for girls. They believed that used pads were infectious and that children who played in trash that contained used menstrual pads would get sick.

Additionally, 'splash back' when urinating could cause infections such as gonorrhea, infertility, or urinary tract infections. Girls reported that teachers said using anything but a pad would cause infection.

[She said] our private part is just like a mouth. And if we use tissue paper... [it may get in], and you may be suffering with these diseases. The disease that cannot be cured-- You cannot be having a kid (FGD, School 1, Private)

Behavior During Menses

Both teachers and girls discussed a change in girls' behavior in class, on the playground, and in the way they used facilities at school. Girls in both private and public schools said that they had trouble paying attention in class when they were menstruating. However, they discussed behaving the same as usual, but only when they felt that no one knew they were menstruating.

Girl 1: *To other people, some have joy, some are 'moodless' [having no affect]*

Girl 2: *They treat you the way they [normally do] because they don't know you are having your periods*

Girl 3: *No, they will abuse you.*

Girl 1: *You just feel sick and moodless. You don't want to eat. (FGD, School 3, Private)*

If you were a talkative person, you just sit where you are, and you just talk a little bit. If you are a runner, you walk. (FGD, School 5, Public)

Girls said that they made sure to keep their used pads in their pockets instead of putting them in the public trash pile because they did not want others to know they were menstruating. In public schools, where private disposal options were available, girls also talked about trying to play football or run around to take their minds off of menstruation. Unfortunately, some girls in public school did not feel comfortable playing games because they feared sexual harassment from boys.

Girl 1: *Some boys, they pretend that they're playing with you. Like, playing football. When they're playing, they come, and touch your breast. You think that's it's just a play, but they have...*

Girl 2: *Their intensions*

Girl 3: *We would like it to stop*

Girl 1: *We feel devastated (FGD, School 5, Public)*

Attitudes Regarding Menstrual Materials and Stains

Girls who used any material other than pads were stigmatized, even within the focus groups. For example, in one school, a girl reported that she used a sponge when she was menstruating, and everyone else laughed at her. In another school the teacher said that girls used cloth at times if they did not have access to disposable pads, but the girls in the focus group never disclosed this.

Girls in the focus groups also referred to those who stained their uniforms as irresponsible. They felt fear and shame related to stains. This was due to internalized stigma as well as teasing from boys.

Because now, the blood is on her uniform. She may remove her sweater and cover herself so that the rest of the pupils will not see the blood because it indicates a bad picture. (FGD, School 2, Private)

Here, the participant is saying that staining her clothes would cause her peers think she wasn't the 'right' kind of girl. Sometimes, boys amplify the internalized stigma girls feel.

Girl 1: *You have a lot of fear*

Interviewer: *Why are you having a lot of fear?*

Girl 1: *[Staining] can make you feel ashamed.*

Girl 2: *boys they start showing each other*

Girl 1: *"look at this girls, have no..."*

Girl2: *and they start laughing periods (FGD, School 3, Private)*

Access to sanitary pads would prevent girls from having menstrual accidents regularly, but girls do not always have the money to buy them. While some families could provide disposable pads for their daughters, many girls in private schools could not afford pads. The girls in public school focus groups said that they were able to access pads without any problems, but some of their peers lacked the agency to talk to their teachers to ask for pads.

Social Environment

The behavior from teachers, boys and other girls were both helpful and harmful. Female teachers spoke to girls regularly about how to use pads when menstruating, but they peppered these conversations with fallacies as well. Girls only described their male peers in an adversarial manner, but they described female peers as being supportive when they were menstruating or spreading rumors around the school. . These factors were similar in public and private schools.

Female teachers

Language around menstruation was fairly constant across all schools. Teachers discussed the importance of self-control, being clean, avoiding infections, and avoiding boys. During focus groups, girls reported that their teachers said that now that girls are ‘in adolescence’ they must maintain physical control by refraining from running and jumping too much, and maintain control of their emotions by acting ‘normal’ and remembering not to be sad, ‘moodless,’ or harsh. Female teachers at every school also emphasized the importance of cleanliness or hygiene, and used threats to ensure that girls followed these rules.

I remember when the teacher came and told us, that if you receive your period, the first thing that you go and take a shower and you take a pad and you wear, and after that journey, you must be sure every now and then you go to the toilet to see yourself if a map [stain] has moved there. You need to be sure because if a boy or a teacher or other men see you, they will tell you that you are over careless and dirty, you are lazy. That you are embarrassing the female teachers. So you must wash and be keen. (FGD, School 1, Private)

Teachers singled-out girls who may not have adhered to their warnings about alternative materials causing infection. This was observed during an anonymous question session where the teacher that introduced the researcher gave a speech to the 150 girls present.

The day before yesterday I was surprised that someone showed me a piece of cloth that she is using as a sanitary pad...Are you here? [Teacher is looking for the student she's referring to]...Why do you want to shame us walking with a piece of cloth as a pad? What's wrong with you? These pads [at school] belong to you! (Teacher during Anonymous Question Session, School 6, Public)

Male Teachers

All the male teachers said that they do not teach girls about menstruation because the girls feel too ashamed to discuss menstruation with them. Girls do not trust their male teachers to handle issues related to menstruation properly. Stories such as this one were common in all of the schools:

Girl 1: *There was a girl, she had her period suddenly, and her class teacher was a female but she was not there that day. So she went directly to the male teacher... So when she told the male teacher, the male teacher started asking her questions, "oh how do you feel" instead of just helping her directly. So, since then, now girls couldn't tell male teachers.*

Girl 2: *We like to tell a female teacher because she has experienced that. And she won't expose. But a male, he will expose*

Girl 3: *We don't trust the men. He will start laughing, he will tell other girls (FGD, School 5, Public)*

Female teachers said that their male counterparts are comfortable talking about menstruation with their students, but in the same conversation, they said things like:

When their uniform are stained, you normally see them tying their buttocks with the sweater [tying the sweater from their uniform around their waist to cover menstrual stains]. And you see, when you meet a male teacher, they say, "eh, why are you tying that sweater, you are supposed to put it on!" (Teacher, School 6, Public)

Boys

Girls at every school expressed fear and stress related to boys. In one school, girls stopped using the FLTs even though they were far cleaner than the traditional toilets because boys were trying to peak into stall through vents in the doors. Boys' teasing ranged from jokes to harassment.

Interviewer: *How do boys tease?*

Girl 1: *They may say, now you're a mother.*

Girl 2: *They will say that you will have 15 babies*

Girl 3: *They will start imagining the number of children you will have*

Girl 1: *Or they say you are raining.*

[...]

Girl 4: *They may not let you stay in peace in class. They will disturb you. Let's say your books, they may take all of them. So that you can stand up*

[...]

Girl 1: *You might stand up from your bench and you don't know that you have messed (FGD, School 5, Public)*

Here, the boys knew that a girl might have her period, and they made the girls stand up to expose a stain on her uniform. Teachers generally place the onus on girls to change this situation. They say that girls must either ignore boys when they tease, or they may say, that teasing happens because girls are "mixed up with boys."

Gossip Girls vs Heart Friends

Girls describe some female classmates who also may tease, and other female classmates who are helpful when they have a menstrual emergency at school. A 'gossip girl' may find that a peer has dripped blood in the toilet bowl and spread the information to everyone else.

Conversely, heart friends were the classmates who helped by blocking a stain from view, telling

a teacher that a girl needs pads or needs permission to go home, or by coming to talk to a girl who is sitting alone and sad because she is menstruating and afraid to play with everyone else.

Physical Environment

WASH facilities and pad availability at school determined whether or not girls could stay in school all day when they were menstruating and how comfortable they felt managing their menstruation at school.

WASH Facilities

Girls wanted private access to water to manage their period at every school, but only one school (a public school) had a private area for girls to wash stained clothes or body parts during the site visit. In every school but this one, girls usually went home to take care of stains. However, girls in public schools were far less likely to stain their clothes because they had regular access to pads.

If your clothes have been stained, she [the teacher] gives you the sanitary towels, you wear them, and then you go home. (FGD, School 6, Public)

If she [the teacher] sees you, that you have messed bad, she will tell you to go home and shower and wear a pad...[but] you could go home and find no one in the house and you could not come back to school because of the sanitary pads. So there is some lesson that you could miss that day. (FGD, School 1, Private)

There were lines to use the toilets at public and private schools because students were only allowed to use the toilet at break times. As a result, girls said they felt rushed to finish changing their pads, and they sometimes waited until they could go home. They recommended that the school should build separate rooms specifically for changing pads and washing stains.

Girls in all of the focus groups were concerned about disposal. Girls were satisfied with disposal in the FLT's because each stall has a disposal bin. Only one private school had private disposal, and this is because they had an FLT. In schools that did not have any private disposal options, girls had to carry used pads with them.

Since the pad box is not there, if you put the pad in your pocket it may start smelling or it may fall down and you'll get embarrassed. And ashamed. (FGD, School 2, Private)

In public schools, disposal bins were only in one or two toilet stalls in the traditional pour flush toilets. Sometimes girls threw their used pads on the floor if they couldn't wait for a stall with a disposal bin, which scared younger children who would urinate or defecate on the floor to avoid going near the used pad. At one school the cleaner refused to clean the toilets when girls threw their pads on the floor, and beat any girl that came near, causing a great deal of fear and stress for girls. He also locked the door when he did not want girls to make the toilets dirty after he had finished cleaning.

***Girl 1:** He is always angry. If he is cleaning and you go there, you'll make him even more angry.*

***Girl 2:** Even you can be beaten.*

***Girl 3:** If you just go to fetch water to drink it, you can be beaten. (FGD, School 6, Public School)*

Muslim girls did not have consistent access to the materials they needed for ablution.

It's a challenge because there are some classes which don't have the bottle [for ablution]. So you can borrow, but sometimes, you go to a class and they tell you they don't have bottles, but you can see them. The teacher denies you the bottles and you just go. That's actually a really big problem. And if you bring bottles, they are stolen. (FGD, School 6, Public).

Some toilets at school couldn't facilitate ablution at all. FLT's do not allow water inside, so girls referred to them as the 'Christian toilets' because Muslim students could not use them.

Instead, they had to use older traditional toilets that were far dirtier and less likely to have a private disposal bin or locks.

Pad Provision

Girls in the FGDs at public schools reported having regular access to menstrual pads. However, they also said that some girls were too shy, and did not feel comfortable talking to their teachers or parents about getting pads.

What about those girls who have monthly periods and they are afraid to tell their teacher. What should they do? (Anonymous question, School 5, Public)

Private schools did not receive pads from the government, and girls in every private school requested pads during the focus groups and anonymous questions sessions. They said that NGOs came and each girl received two pads, but it was not enough, and the NGOs did not come regularly.

Interviewer: Do donors bring pads?

Girl 1: Kibahati kibahati tu [Only every once in a while]

Girl 2: He [the donor] brought 2 pads...so it's not easy (FGD, School 3, Private)

Girls at private schools stained their clothes and went home more frequently than girls in public schools because they did not have regular access to menstrual pads.

Societal Factors

Societal factors affecting girls at school included policies dictating sanitary pad provision and WASH facilities at school. The patriarchal culture prevalent in Kenyan society also influenced the types of messages girls heard from their teachers and the level of safety they felt in their communities.

Sanitary Pad Program

Teachers reported that the Kenyan government provided pads and a training on menstrual hygiene education, but only for public schools. It had been almost a year since the last pad disbursement and teachers were not sure when or if the government would distribute more pads. They described rationing the pads because there were not enough to give to each girl for the duration of her period.

Now, we are fearing to give them a whole packet. Even now if they come, I give them maybe 4. And those ones who are coming from the slums, they are the ones I give a whole packet. Because those ones, will stay home until the period is over.
(Teacher, School 5, Public)

Female teachers from public schools who went to the government training learned how to make girls feel comfortable asking questions about menstrual pads. In one school, the deputy head teacher created a sign out sheet, and girls could ask her for a key to her office so they could go sign out the number of pads they needed. In another school, the female teachers created a code word for pads:

They come and they call it [sanitary pads] bread. So when they come and they say I need a bread, we know what they are talking about **(FGD, School 5, Public)**

In private schools this type of support was not as clear. Teachers did not discuss creating relationships with girls. In School 1, a participant said,

If [...] the teacher sees that she [a girl] doesn't know about how to take care of herself properly, she will call all the girls in the meeting and tell them how to be. **(FGD, School 1, Private)**

Here, the teacher calls all of the students together instead of having a conversation with one girl in particular. Meanwhile, at public schools teachers took a more personal approach.

When they come, some of them come crying, you tell them sit down, you have a talk one on one. They understand, then they go back to class when she's ok. (Teacher, School 6, Public)

Girls talk about their teachers as authoritarian or more lenient depending on the school type. At private schools, the teacher was more likely to be described as an authoritarian. Girls went to her because she was the only one who could grant permission to go home. At public schools, teachers were reported to be more compassionate, and girls went to the teacher with questions or problems. At the public schools, girls in the focus groups expressed far less worry about their periods than the girls in private schools.

National WASH Guideline Adherence

Public schools adhered to the majority of national guidelines for school WASH, while private schools did not. Table 1 shows that the average latrine to pupil ratio was lower in public schools (27:1) than private schools (88:1). The public schools however had a higher water point to pupil ratio (509:1) compared to private schools (232:1), although public schools adhered to the national guideline of one water point per toilet block. The national WASH guidelines state that every toilet block should contain at least one place for disposal in or near a toilet block. While every public school had at least one private disposal bin, only one private school did. The national guidelines also stipulate that schools should have facilities for ablution, but girls in every school with a large population of Muslim students had trouble performing ablution.

Concerns about Male Aggression and Rape

In addition to the shame discussed earlier with regard to harassment from boys, girls had anxiety about being raped. Teachers told girls that now that they had their periods, they must be wary of boys and men. In addition to generalized worry girls had because of what their teachers said in class, some participants experienced rape and they were worried about whether or not they might get pregnant as a result.

When someone is continuing with the period and is raped is there any chance to get pregnant? (Anonymous question, School 4, Public School)

Girls also discussed feeling less safe in their communities after they reached menarche.

Girl 1: *When you have your period, you should take care of your neighbors because some neighbors are bad.*

Girl 2: *Because they may rape.*

Girl 1: *They may abuse you. (FDG, School 5, Public)*

Family members were considered dangerous because they might misconstrue friendliness as a sexual advance.

Girl 1: *Even hugging your brothers. You should keep away from them*

Girl 2: *If you're grown up let's say,*

Girls 3: *Even your uncle, say he has just come from Mombasa, do not run to him and hug him.*

Girl 4: *Go and greet him with hands. Say hi with words*

Girl 1: *Don't go and jump*

Girl 4: *You should not be that close to men. Even if your father has come with a male friend to the house, it is not good to go and greet him. (FGD, School 5, Public)*

Discussion

In this study, we examined the ways in which individual, social, physical, and societal factors influenced girls' experience of menstruation at school. Personal agency, support from teachers and peers, access to menstrual management materials and WASH facilities were necessary for girls to feel comfortable managing menstruation. Girls in public schools had more access to sanitary pads, but Muslim girls practicing ablution were unable to use certain toilets because they did not allow water inside, or they could not practice ablution at all when teachers did not allow them to use containers for water. Public schools were also more likely to have access to disposal and private access to water, but access was not consistent for every toilet. Teachers in both public and private schools presented information that was incorrect to their students, however teachers in public schools were more likely to speak to girls compassionately on an individual basis to allay their fears about menstruation. The results of these data have implications for measuring access through WASH monitoring and evaluation indicators, encouraging gender equitable education, and for improving Kenyan school WASH guidelines.

Sustainable Development Goals

The data in this study suggest that different measurements of access are necessary to identify disparities in access among subgroups of girls. Goal six of the Sustainable Development Goals (SDG 6) is to, "ensure the availability and sustainable management of water and sanitation for all" (JMP, 2013). The schools in this study had toilets available to girls and a large number of children may have used them. However, there are a number of factors that limit

girls' actual access to toilets even when there appear to be enough available. Some girls said that they go home when the toilets are too dirty to feel comfortable changing their pads or when they do not have enough time to clean a stain from their skirt because of long lines for toilet use. These are similar to what has been found in the Philippines, and other parts of Kenya (Caruso et al., 2014; Ellis et al., 2016; Nyothach et al., 2015). Religious practices were a factor in access as well. Muslim girls had to compromise their religious beliefs or use older, dirtier toilets when the new toilets, did not accommodate ablution. Fears about security also prevented access. Girls did not use toilets when they were afraid of boys who tried to sexually harass them when they were changing a pad, a theme also reported in the Philippines (Haver et al., 2012). These and other factors undermine the JMP's goal of equitably meeting WASH targets (JMP, n.d.). Furthermore, none of the information found from this study would be collected under current JMP data collection procedures because slums are not considered to be official data collection sites. However, the JMP has medium/long term plans to include slums in its data collection (JMP, n.d.). Careful targeting of data collection that includes a focus on specific segments of school populations that may be otherwise neglected is necessary to create a complete depiction of access in institutional settings. A toilet's presence at school, and use by large numbers of students does not ensure equity in access (Ellis et al., 2016; JMP, n.d.).

Girls Education and Empowerment

SDG-5 and SDG-6.2 specifically focus on gender equality and empowerment of women (United Nations Economic and Social Council, 2016), but the sexualized and gendered nature of menstrual hygiene education found in the data undermines these goals (Igras et al., 2014).

Teachers in almost every school shamed girls for staining their clothes. This type of treatment

may create more stigma around menstruation (Kirk & Sommer, 2006). Female teachers told girls that when girls stained their skirts it embarrassed female teachers in front of male teachers, sending a message to girls that the opinions of men are more important than their own. These actions contribute to the overall shame that girls feel about menstruation, reinforce the idea that menstruation should be hidden, (Johnston-Robledo & Chrisler, 2013), and solidify the idea that women are not equal to men (Igras et al., 2014; O-saki & Agu, 2002).

Teachers' discourse around menstrual management highlights unequal treatment that girls receive at school. Foucault asserts that teachers exert power over students by shaping their understanding of sex and sexuality (Foucault, 1990). Teachers told girls that they must beware of men and other boys now that they are menstruating, implying that they are now sexual objects (Joshi et al., 2015). Teachers also absolved boys of teasing girls because girls should not be 'mixing up' with boys, further solidifying the idea that boys should not be held accountable for their actions (Ruto, 2009). This discourse may lead girls to believe that they are at fault when they are harassed or sexually assaulted, which is harmful to their mental health (Ruto, 2009; Tavrow et al., 2013), and is evidence that gender parity in the classroom does not amount to gender equity in school (Thomas & Rugambwa, 2013).

Teachers in this study warned girls against being attracted to boys and having sex, stating that if they have sex, they would immediately get pregnant. As a result of language like this, girls may feel shame about attraction to other people and they may stop trusting teachers because they receive false information. Girls are more likely to engage in risky sex when they do not have correct information about reproductive health (Kirby, 2008). The actions by

teachers in this study reinforces Sommer's suggestion that educators outside of the school system should be responsible for menstrual hygiene and reproductive health education (Sommer, 2009).

Menstrual Hygiene and Reproductive Health

Holistic reproductive health education that encompasses menstrual hygiene is necessary to replace current lessons girls receive in school. Teachers in this study couch menstruation within discussions of girls' sexuality, but they present incorrect, harmful information to girls. This is not an isolated occurrence, as teachers discussing sex in conjunction with menstruation has been recorded elsewhere in Kenya, Ghana and Bolivia (Joshi et al., 2015; Long et al., 2013) Researchers have been calling for a sectoral approach to menstrual hygiene management that incorporates the education, WASH, and sexual/reproductive health sectors for many years, but movement toward this objective is slow (Kirk & Sommer, 2006; McMahon et al., 2011; Sommer et al., 2015b). Nonetheless, research supports this approach; girls' ability to confidently manage their menstruation during early adolescence makes them more likely to exercise agency in sexual relationships later in life and maintain their reproductive health throughout the life course (Sommer et al., 2015a). When girls reach menarche and do not have access to adequate knowledge and support, they have a higher likelihood of engaging in early sexual debut, early pregnancy and increased alcohol use (Deardorff et al., 2005). This link between menarche and sexual/reproductive health should be highlighted as implementers devise new programs around sexual and reproductive health, and menarche should be incorporated into new sexual and reproductive health curricula for young girls.

Kenyan School WASH

Public schools in this study benefitted greatly from Kenyan school policies including the Sanitary Pad Programme and the WASH guidelines, however problems with implementation and access still persisted. Teachers did not receive enough pads to give a supply to each student every month. And some girls were too shy to go to their teachers when they were menstruating. This created an inequitable environment because girls gained access to resources based on their level of agency, not necessarily their level of need. Teachers were also unsure of when they would receive more pads from the government, and had not received a supply in almost a year. As Paulino and Thinguri (2015) illustrated in their study, the Sanitary Pad Programme is an innovative idea, but the details of its implementation needs improvement. Moving forward, it would be best for the government to be clear about the frequency that schools will receive pads, create concrete definitions for who qualifies for pads and straightforward mechanisms for distributing them to students.

The Kenyan national WASH guidelines provide a framework for schools to provide an adequate environment for managing menstruation, however inconsistencies and inequities still exist regarding access to water, ablution, and disposal. The guidelines say that schools need to have one water point per latrine block, but this can mean 1 water source for more than 20 latrines, which was insufficient for girls' water needs. The national guidelines specify that ablution facilities should be available at school, but teachers blocked access to water containers in some schools, and girls could not perform ablution in FLTs. When girls did not have private access to disposal bins in every stall, they threw used pads on the floor or into the toilet, causing further health risks when young children urinated or defecated on the floor in response

(Caruso et al., 2014). Muslim girls were unable to use the FLT's because extra water for ablution was not permitted inside. The FLT's were most likely to have access to a private disposal bin, but they had to resort to traditional toilets instead, only a handful of which had disposal bins. When schools have populations with differing sanitation needs, it is imperative that improvements made to sanitation facilities benefit the range of needs present so that efforts improve conditions for all and do not contribute to inequity.

Findings from this study illustrate that Kenyan national policies can be beneficial to girls managing menstruation at school, however this benefit is only received by schools that follow the policies. Private schools do not follow the policies, but they play an important role in slum communities because the Kenyan government has failed to create public schools in most slum communities. Despite the fact that there are 300,000 school aged children in Mathare, there are only 4 public schools (Economist, 2015), serving 4,500 children at most. Many development organizations support the promotion of private schools in underserved communities because they operate at cheaper costs and increase access to education (Oketch & Ngware, 2010). However, none of the schools in this study met the national standards for school water, sanitation and hygiene, and this is consistent with the majority of Kenyan private schools in slums (Edwards et al., 2015). While private schools may increase access to education for some students, they do not create an environment equal to that of public schools for girls managing menstruation. As the number of private schools increase, the Kenyan government should consider ways to incorporate private schools into the public system and create access to education equal to those who live outside of slums (APHRC, 2014; Edwards et al., 2015; Oketch & Ngware, 2010).

Strengths and Limitations

We spoke to girls from both public and private schools with different types of facilities, and from a variety of economic and religious demographics. Prior research has not addressed differences in experience for Muslim and Christian girls in the same WASH setting, and this research contributes to the growing body of literature about menstrual hygiene in slums as well.

The study had several limitations. Only girls in grades 6-8 participated in focus groups, but teachers mentioned that there were some girls who had reached menarche but were in lower grades. Future research should explore the experiences of girls who reach menarche when their classmates have not. Additionally, Muslim girls did not seem to be comfortable sharing their opinions about unequal facilities at school when Christian girls were also in the group discussion. Future research should aim to have separate focus groups for different religions in situations similar to this.

Conclusion

This study highlights the interconnected facets of menstrual hygiene management in school. Communities and school administrators as well as government policies and oversight determine whether school facilities support or hinder girls' menstruation experience. Education on menstrual hygiene reflects larger cultural beliefs, and teachers often project their own views about gender norms and sexuality onto these lessons as well. As a result of this education, girls associate menstruation with ideas about sexuality, puberty, religious practices as well as hygiene, which can be problematic when teachers maintain harmful views about gender roles.

Approaches to menstrual hygiene management should consider equitable access to WASH facilities for all users as well as information delivery that addresses menstruation in the context of larger pubertal changes.

Chapter 4: Conclusion and Recommendations

The findings in this study examined the ways that various levels of girls' social ecology in two Nairobi slums influence their experience of menstruation at school. At the individual level we found that girls were confused about specific biological processes associated with menstruation. Teachers in both public and private schools presented information that was incorrect to their students, however teachers in public schools were more likely to speak to girls compassionately on an individual basis to allay their fears about menstruation. With regard to school WASH facilities, girls had access to more toilets and pads in public schools, however Muslim girls were unable to use certain ones. Meanwhile, in private schools, girls had less access to menstrual pads and less access to private disposal mechanisms. The findings highlight issues that should be addressed in current work around menstrual hygiene management, and areas for future research.

Societal Level Factors

As the JMP works to create indicators for the Sustainable Development Goals, it is necessary to find ways to operationalize their objective to create equitable access for everyone (JMP, n.d.). Muslim girls in this study did not have equitable access to sanitation facilities at their schools. This was either because FLT's could not accommodate ablution or because their teachers would not allow girls to use water containers necessary for ablution. Girls were also unable to access toilets because boys were harassing them as they tried to use FLT's. As working groups develop indicators, they must identify vulnerable sections of the population, which may

vary from one population to the next, and ensure that they have specific measures for equitable access to WASH facilities.

Physical Level Factors

The Sanitary Pad Programme was well-liked by all of the girls in public schools; however, key components of the program must be modified and the overall program must be evaluated to understand the full effect it has on girls' education. Girls in public schools were glad that they had increased access to sanitary pads, and their teachers were more compassionate due to training from the government. However, girls without the agency and confidence to approach their teachers when they needed menstrual pads had less access. Furthermore, teachers were responsible for identifying the neediest students, leaving a great deal of room for error. Additionally, girls attending private slum schools, who may have an even greater need than those attending public schools (Oketch & Ngware, 2010), did not have access to government-funded menstrual pads. The Sanitary Pad Programme must be evaluated to understand how it can be most effective, and how each component of the program may be improved to have the greatest possible impact.

Water, Sanitation, and Hygiene standards must be created for all schools, not only the schools funded by the government. We found that girls at private schools had less access to WASH facilities compared to girls at public schools. This difference in access to WASH facilities is part of a larger systemic problem in which slum communities are largely unrecognized as legal residences, so they do not receive the same level of government support nor are they required to adhere to national WASH guidelines. Remedying this issue will require major efforts

from a variety of stakeholders. New ways to ensure proper sanitation for all students must be addressed now. Sanergy's Fresh Life Toilets provide an excellent, low-cost solution to sanitation difficulties in slum schools. However, it is imperative that new sanitation innovations meet the needs of all students in the school population to prevent further inequity.

Social Level Factors

Qualitative research is necessary to explore the content of the lessons teachers provide about menstrual hygiene. We found that teachers spoke about girls' responsibility to prevent rape as well as their susceptibility to pregnancy and sexually transmitted infections. Teachers discussed all of these issues in such a way that girls were confused about the relationships between pregnancy, STIs, and menstruation. This style of language contributed to fears and anxiety girls had about their period. It also contributed to the culture of oppression in which girls functioned every day. Menstrual Hygiene Management is currently considered to be a small subset of the WASH sector. This is because the most easily discernable aspects, namely access to water and sanitation facilities and menstrual materials, are related to WASH. However, MHM is salient to girls' education, their sense of self, and their reproductive lives. Proper handling of this issue requires the dissolution of sectoral barriers and a holistic focus on women as multifaceted beings. Research findings in this study further justify the need for cooperation between the WASH, sexual/reproductive health, and education sectors to provide girls with the most comprehensive approach to puberty education, and empower them to question patriarchal notions of sex and sexuality.

Individual Level Factors

Further research is necessary to understand the behaviors, beliefs, and challenges of girls in diverse settings to discern the breadth of issues they face related to menstruation (Sommer et al., 2016). Girls in this research were particularly concerned about reproductive tract infections. More research is necessary to understand why this may be, and whether or not there is a higher incidence of reproductive tract infections among girls and women in slum settings.

Although research and attention regarding menstrual hygiene management has increased dramatically over the last decade, more work is still necessary to identify specific levers for change and ways to evaluate progress.

References

- Adams, J., Bartram, J., Chartier, Y., & Sims, J. (2009). *Water, sanitation and hygiene standards for schools in low-cost settings*: World Health Organization Geneva, Switzerland.
- Adinma, E. D., & Adinma, J. (2009). Perceptions and practices on menstruation amongst Nigerian secondary school girls. *African Journal of Reproductive Health*, 12(1), 74-83.
- Al-Sheikh, A. F. a.-H. (1996). *Water and Sanitation in Islam*. Retrieved from Alexandria, Egypt: <http://apps.who.int/iris/handle/10665/119557>
- Alexander, K. T., Oduor, C., Nyothach, E., Laserson, K. F., Amek, N., Eleveld, A., . . . Mohammed, A. (2014). Water, sanitation and hygiene conditions in Kenyan rural schools: are schools meeting the needs of menstruating girls? *Water*, 6(5), 1453-1466.
- Allen, C. F., Desmond, N., Chiduo, B., Medard, L., Lees, S. S., Vallyely, A., . . . Hayes, R. J. (2010). Intravaginal and menstrual practices among women working in food and recreational facilities in Mwanza, Tanzania: implications for microbicide trials. *AIDS and Behavior*, 14(5), 1169-1181.
- APHRC. (2014). *Population and Health Dynamics in Nairobi ' s Informal Settlements: Report of the Nairobi Cross-sectional slums survey 2012*. Retrieved from Nairobi: <http://aphrc.org/wp-content/uploads/2014/08/NCSS2-FINAL-Report.pdf>
- BBC. (2015). Kenya Slum Mathare Gets Cheap Water Through ATMs. Retrieved from <http://www.bbc.com/news/world-africa-33223922>
- Blum, R. W., Bastos, F. I. P. M., Kabiru, C., & Le, L. C. (2012). Adolescent health in the 21st century.
- Bobel, C. (2010). *New blood: Third-wave feminism and the politics of menstruation*: Rutgers University Press.
- Bocquier, P., Beguy, D., Zulu, E. M., Muindi, K., Konseiga, A., & Yé, Y. (2011). Do migrant children face greater health hazards in slum settlements? Evidence from Nairobi, Kenya. *Journal of Urban Health*, 88(2), 266-281.
- Brown, A. M. (2007). WID and GAD in Dar es Salaam, Tanzania: Reappraising gender planning approaches in theory and practice. *Journal of Women, Politics & Policy*, 28(2), 57-83.
- Caruso, B. A., Dreibelbis, R., Ogutu, E. A., & Rheingans, R. (2014). If you build it will they come? Factors influencing rural primary pupils' urination and defecation practices at school in western Kenya. *Journal of Water Sanitation and Hygiene for Development*, 4(4), 642-653.
- Caruso, B. A., Fehr, A., Inden, K., Sahin, M., Ellis, A., Andes, K. L., & Freeman, M. (2013a). WASH in Schools empowers girls' education in Freetown, Sierra Leone: An assessment of menstrual hygiene management in schools. *New York: UNICEF*.
- Caruso, B. A., Long, J. L., Yerian, S. E., Haver, J., Penakalapti, G., Ellis, A., . . . Freeman, M. (2013b). *WASH in Schools Empowers Girls' Education: Tools for Assessing MENstrual Hygiene Management in Schools*. Retrieved from New York, New York:
- Corburn, J., & Hildebrand, C. (2015). Slum Sanitation and the Social Determinants of Women's Health in Nairobi, Kenya. *Journal of Environmental and Public Health*, 2015, 6. doi:10.1155/2015/209505

- Corburn, J., & Karanja, I. (2014). Informal settlements and a relational view of health in Nairobi, Kenya: sanitation, gender and dignity. *Health Promotion International*. doi:10.1093/heapro/dau100
- Crichton, J., Okal, J., Kabiru, C. W., & Zulu, E. M. (2013). Emotional and psychosocial aspects of menstrual poverty in resource-poor settings: A qualitative study of the experiences of adolescent girls in an informal settlement in Nairobi. *Health care for women international*, 34(10), 891-916.
- Crofts, T., & Fisher, J. (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.
- Crow, B., & Odaba, E. (2010). Access to water in a Nairobi slum: Women's work and institutional learning. *Water International*, 35(6), 733-747. doi:10.1080/02508060.2010.533344
- Cunningham, W., McGinnis, L., Verdú, R. G., Tesliuc, C., & Verner, D. (2008). Youth at risk in Latin America and the Caribbean. *The World Bank, Washington DC*.
- Darkey, D., & Kariuki, A. (2013). A Study on Quality of Life in Mathare, Nairobi, Kenya. *J Hum Ecol*, 41(3), 207-219.
- Darkley, D., & Kariuki, A. (2013). A Study on Quality of Life in Mathare, Nairobi, Kenya. *Journal of Human Ecology*, 41(3), 13.
- Das Gupta, M., Engelman, R., Levy, J., Luchsinger, G., Merrick, T., & Rosen, J. (2014). *The Power of 1.8 Billion: Adolescent, Youth and The Transformation*. Retrieved from https://www.unfpa.org/sites/default/files/pub-pdf/EN-SWOP14-Report_FINAL-web.pdf
- Deardorff, J., Gonzales, N. A., Christopher, F. S., Roosa, M. W., & Millsap, R. E. (2005). Early puberty and adolescent pregnancy: The influence of alcohol use. *Pediatrics*, 116(6), 1451-1456.
- Dhingra, R., Kumar, A., & Kour, M. (2009). Knowledge and practices related to menstruation among tribal (Gujjar) adolescent girls. *Studies on Ethno-Medicine*, 3(1), 43-48.
- DiClemente, R. J., Salazar, L., Crosby, R., & Rosenthal, S. (2005). Prevention and control of sexually transmitted infections among adolescents: the importance of a socio-ecological perspective—a commentary. *Public health*, 119(9), 825-836.
- Dobash, R. E., & Dobash, R. (1979). *Violence against wives: A case against the patriarchy*: Free Press New York.
- Dorgbetor, G., & Sahin, M. (2015). Mainstreaming menstrual hygiene management in schools through the play-based approach: lessons learned from Ghana. *Waterlines*, 34(1), 41-50.
- Economist. (2015). The \$1-a-week school. Retrieved from <http://www.economist.com/news/leaders/21660113-private-schools-are-booming-poor-countries-governments-should-either-help-them-or-get-out>
- Edwards, D. B., Klees, S. J., & Wildish, J. (2015). *Dynamics of Low-Fee Private Schools in Kenya: Governmental legitimation, school-community dependence, and resource uncertainty*. Retrieved from https://www.academia.edu/Documents/in/Low_cost_private_schools
- Ekong, I. E. (2015). Perception of Menstruation among Adolescent Secondary School Girls in Akwa Ibom State, Nigeria: An Implication For Sexual Health Education for Secondary School Girls. *THE ULUTAS MEDICAL JOURNAL*, 1(3), 74-80.
- El-Gilany, A.-H., Badawi, K., & El-Fedawy, S. (2005). Menstrual hygiene among adolescent schoolgirls in Mansoura, Egypt. *Reproductive Health Matters*, 13(26), 147-152.

- Elimu Yetu Coalition. (2004). *Monitoring of the Free Primary Education and Establishing the Unit Cost of Primary Education in Kenya*. Retrieved from Nairobi:
http://ibrarian.net/navon/paper/MONITORING_OF_THE_FREE_PRIMARY_EDUCATION_AND_ESTA.pdf?paperid=3426392
- Ellis, A., Haver, J., Villasenor, J., Parawan, A., Mohini, V., Freeman, M., & Caruso, B. A. (2016). WASH challenges to girls' menstrual hygiene management in Metro Manila, Masbate, and South Central Mindanao, Philippines. *Waterlines, [In Press]*.
- Esper, H., London, T., & Kanchwala, Y. (2013). *Improved Sanitation and its Impact on Children: An exploration of Sanergy. Impact Case Study No. 2*. Retrieved from Ann Arbor, Michigan:
- Fatusi, A. O., & Hindin, M. J. (2010). Adolescents and youth in developing countries: health and development issues in context. *Journal of adolescence, 33*(4), 499-508.
- Foucault, M. (1990). *The history of sexuality. Volume one: An introduction*. New York: Vintage Books.
- Garg, R., Goyal, S., & Gupta, S. (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.
- Garg, S., Sharma, N., & Sahay, R. (2001). Socio-cultural aspects of menstruation in an urban slum in Delhi, India. *Reproductive Health Matters, 9*(17), 16-25.
- Garn, J. V., Caruso, B. A., Drews-Botsch, C. D., Kramer, M. R., Brumback, B. A., Rheingans, R. D., & Freeman, M. C. (2014). Factors Associated With Pupil Toilet Use in Kenyan Primary Schools. *International Journal of Environmental Research and Public Health, 11*(9), 9694-9711. doi:10.3390/ijerph110909694
- Garn, J. V., Greene, L. E., Dreibelbis, R., Saboori, S., Rheingans, R. D., & Freeman, M. C. (2013). A cluster-randomized trial assessing the impact of school water, sanitation and hygiene improvements on pupil enrolment and gender parity in enrolment. *Journal of Water Sanitation and Hygiene for Development, 3*(4), 592-601.
- Gultie, T., Hailu, D., & Workineh, Y. (2014). Age of menarche and knowledge about menstrual hygiene management among adolescent school girls in Amhara province, Ethiopia: implication to health care workers & school teachers. *PLoS One, 9*(9), e108644. doi:10.1371/journal.pone.0108644
- Guterman, M. A., Mehta, P., & Gibbs, M. (2008). Menstrual taboos among major religions. *The Internet Journal of World Health and Societal Politics, 5*(2), 2.
- Hargreaves, J. R., Bonell, C. P., Boler, T., Boccia, D., Birdthistle, I., Fletcher, A., . . . Glynn, J. R. (2008). Systematic review exploring time trends in the association between educational attainment and risk of HIV infection in sub-Saharan Africa. *Aids, 22*(3), 403-414.
- Haver, J., Caruso, B. A., Ellis, A., Sahin, M., Villasenor, J., Andes, K. L., & Freeman, M. (2012). *WASH in Schools Empowers Girls' Education in Masbate Province and Metro Manila, Philippines*. Retrieved from New York:
- House, S., Mahon, T., & Cavill, S. (2012). Menstrual hygiene matters: a resource for improving menstrual hygiene around the world.
- Igras, S. M., Macieira, M., Murphy, E., & Lundgren, R. (2014). Investing in very young adolescents' sexual and reproductive health. *Glob Public Health, 9*(5), 555-569.

- Irinoye, O., Ogungbemi, A., & Ojo, A. (2002). Menstruation: knowledge, attitude and practices of students in Ile-Ife, Nigeria. *Nigerian journal of medicine: journal of the National Association of Resident Doctors of Nigeria*, 12(1), 43-51.
- JMP. (2013). WASH Post-2015: Proposed Targets and Indicators for Households, Schools and Health Centers. Geneva: WHO.
- JMP. (n.d.). WASH Post-2015 Proposed indicators for drinking water, sanitation and hygiene http://www.wssinfo.org/fileadmin/user_upload/resources/JMP-WASH-Post-2015-Brochure.pdf: World Health Organization, UNICEF, Joint Monitoring Program.
- Johnston-Robledo, I., & Chrisler, J. C. (2013). The menstrual mark: Menstruation as social stigma. *Sex roles*, 68(1-2), 9-18.
- Jones, R., & Finlay, F. (2001). Sanitary towel provision and disposal in primary schools. *Child: care, health and development*, 27(1), 85-92.
- Joshi, D., Buit, G., González-Botero, D., & Sahin, M. (2015). Menstrual hygiene management: education and empowerment for girls? *Waterlines*, 34(1), 51-67.
- Joshi, D., Fawcett, B., & Mannan, F. (2011). Health, hygiene and appropriate sanitation: experiences and perceptions of the urban poor. *Environment and Urbanization*, 23(1), 91-111.
- Kaaya, S. F., Mukoma, W., Flisher, A. J., & Klepp, K. I. (2002). School-based sexual health interventions in sub-Saharan Africa: A review. *Social Dynamics*, 28(1), 64-88.
- Kabiru, C. W., Izugbara, C. O., & Beguy, D. (2013). The health and wellbeing of young people in sub-Saharan Africa: an under-researched area? *BMC international health and human rights*, 13(1), 1.
- Kenya Ministry of Education, M. (2010). *Primary School Design*. Retrieved from Nairobi, Kenya: Kenya National Bureau of Statistics, Kenya Ministry of Health, National AIDS Control Council, Kenya Medical Research Institute, National Council for Population and Development, & The DHS program, I. I. (2015). *Kenya: demographic and health survey 2014*: Central Bureau of Statistics.
- Kilonzo, M. (2012). *Talking Notes by the minister of education Hon. Mutula Kilonzo during the national launch of the sanitary towels programme*. Nairobi: Republic of Kenya Ministry of Education Retrieved from <http://www.education.go.ke/ShowPage.aspx?department=1&id=1168>.
- Kirby, D. B. (2008). The impact of abstinence and comprehensive sex and STD/HIV education programs on adolescent sexual behavior. *Sexuality Research & Social Policy*, 5(3), 18-27.
- Kirk, J., & Sommer, M. (2006). Menstruation and body awareness: linking girls' health with girls' education. *Royal Tropical Institute (KIT), Special on Gender and Health*, 1-22.
- Kumar, A., & Srivastava, K. (2011). Cultural and social practices regarding menstruation among adolescent girls. *Social work in public health*, 26(6), 594-604.
- Long, J., Caruso, B. A., Lopez, D., Vancraeynest, K., Sahin, M., Andes, K. L., & Freeman, M. C. (2013) WASH in Schools Empowers Girls' Education in Rural Cochabamba, Bolivia. (pp. 1-56). New York: UNICEF.
- Lucas, A. M., & Mbiti, I. M. (2012). Does free primary education narrow gender differences in schooling? Evidence from Kenya. *Journal of African Economies*, ejs021.

- Mahon, T., & Fernandes, M. (2010). Menstrual hygiene in South Asia: a neglected issue for WASH (water, sanitation and hygiene) programmes. *Gender & Development, 18*(1), 99-113.
- Mahon, T., Tripathy, A., Singh, N., & Sahin, M. (2015). Putting the men into menstruation: the role of men and boys in community menstrual hygiene management. *Waterlines, 34*(1), 7-14.
- Marmot, M., Friel, S., Bell, R., Houweling, T. A., Taylor, S., & Health, C. o. S. D. o. (2008). Closing the gap in a generation: health equity through action on the social determinants of health. *The Lancet, 372*(9650), 1661-1669.
- Martine, G. (2012). *The new global frontier: urbanization, poverty and environment in the 21st century*: Earthscan.
- Mason, L., Laserson, K., Oruko, K., Nyothach, E., Alexander, K., Odhiambo, F., . . . Ngere, I. (2015). Adolescent schoolgirls' experiences of menstrual cups and pads in rural western Kenya: a qualitative study. *Waterlines, 34*(1), 15-30.
- Mason, L., Nyothach, E., Alexander, K., Odhiambo, F. O., Eleveld, A., Vulule, J., . . . Phillips-Howard, P. A. (2013). 'We Keep It Secret So No One Should Know'—A Qualitative Study to Explore Young Schoolgirls Attitudes and Experiences with Menstruation in Rural Western Kenya. *PLoS One, 8*(11), e79132.
- McMahon, S. A., Winch, P. J., Caruso, B. A., Obure, A. F., Ogutu, E. A., Ochari, I. A., & Rheingans, R. D. (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 and human rights, 11*(1), 7.
- Moawed, S. (2001). Indigenous practices of Saudi girls in Riyadh during their menstrual period. *Eastern Mediterranean Health Journal, 7*(1-2), 197-203. Retrieved from <Go to ISI>://BCI:BCI200300309378
- Montgomery, P., Ryus, C. R., Dolan, C. S., Dopson, S., & Scott, L. M. (2012). Sanitary pad interventions for girls' education in Ghana: a pilot study.
- Naeem, K., Klawitter, S., & Aziz, A. (2015). Learning, acting, and learning (LAL) research on schools' menstrual hygiene management (MHM): Pakistan. *Waterlines, 34*(1), 103-112.
- Nahar, Q., & Ahmed, R. (2006). Addressing special needs of girls: challenges in school. *SACOSAN II*.
- Njue, E. K., & Muthaa, G. M. (2015). Influence of Availability of Sanitary Facilities on the Participation of the Girl-Child in Public Primary Schools in Garissa County, Kenya. *Open Journal of Social Sciences, 3*(08), 162.
- NTA. (2014). *School Report Card 2013*. Retrieved from Nairobi Kenya:
- Nyothach, E., Alexander, K. T., Oduor, C., Mason, L., Oruko, K., Odhiambo, F. O., . . . Phillips-Howard, P. A. (2015). Handwashing for menstrual hygiene management among primary schoolgirls in rural western Kenya. *Waterlines, 34*(4), 279-295.
- O-saki, K. M. a., & Agu, A. O. (2002). A study of classroom interaction in primary schools in the United Republic of Tanzania. *Prospects, 32*(1), 103-116.
- Odaga, A., & Heneveld, W. (1995). *Girls and Schools in Sub-Saharan Africa*. The World Bank. Washington, D.C.

- Oduor, C., Alexander, K. T., Oruko, K., Nyothach, E., Mason, L., Odhiambo, F. O., . . . Phillips-Howard, P. A. (2015). Schoolgirls' experiences of changing and disposal of menstrual hygiene items and inferences for WASH in schools. *Waterlines*, 34(4), 397-411.
- Oketch, M., & Ngware, M. (2010). Free primary education still excludes the poorest of the poor in urban Kenya. *Development in Practice*, 20(4-5), 603-610.
- Patton, G. C., Coffey, C., Sawyer, S. M., Viner, R. M., Haller, D. M., Bose, K., . . . Mathers, C. D. (2009). Global patterns of mortality in young people: a systematic analysis of population health data. *The Lancet*, 374(9693), 881-892.
- Paul-Ebhohimhen, V. A., Poobalan, A., & Teijlingen, E. R. (2008). A systematic review of school-based sexual health interventions to prevent STI/HIV in sub-Saharan Africa. *BMC public health*, 8(1), 1.
- Paulino, S., & Thinguri, R. (2015). Critical analysis of the effectiveness of the government policy on provision of sanitary pads to the needy girls in public primary schools in Kenya. *Researchjournal's Journal of Education*, 3(6). Retrieved from <http://www.researchjournal.com/pdf/1711.pdf>
- Pillitteri, S. P. (2011). School menstrual hygiene management in Malawi. Retrieved from http://www.sswm.info/sites/default/files/reference_attachments/PIPER%20PILLITTERI%202012%20School%20Menstrual%20Hygiene%20Management%20in%20Malawi.pdf
- Republic of Kenya Ministry of Education, S., and Technology. (2015). *Education for All 2015 National Review: Kenya*. Retrieved from Nairobi:
- Ruto, S. J. (2009). Sexual abuse of school age children: Evidence from Kenya. *J Int Coop Educ*, 12, 177-192.
- Sahin, M. (2015). Guest editorial: tackling the stigma and gender marginalization related to menstruation via WASH in schools programmes. *Waterlines*, 34(1), 3-6.
- Satterthwaite, D., & Mitlin, D. (2013). A future that low-income urban dwellers want, and can help secure. *International Institute for Environment and Development, Human Settlement Working Paper Series, Poverty Reduction in Urban Areas-38*.
- Sawyer, S. M., Afifi, R. A., Bearinger, L. H., Blakemore, S.-J., Dick, B., Ezeh, A. C., & Patton, G. C. (2012). Adolescence: a foundation for future health. *The Lancet*, 379(9826), 1630-1640.
- Sharif, S., Godia, G., Wamae, A., Migiro, S., Muriithi, A., & Kabaka, S. (2010). *National School Health Strategy Implementation Plan 2010-2015*. Retrieved from Nairobi, Kenya:
- Sommer, M. (2009). Ideologies of sexuality, menstruation and risk: girls' experiences of puberty and schooling in northern Tanzania. *Cult Health Sex*, 11(4), 383-398.
- Sommer, M. (2010a). Putting menstrual hygiene management on to the school water and sanitation agenda. *Waterlines*, 29(4), 268-278.
- Sommer, M. (2010b). Where the education system and women's bodies collide: The social and health impact of girls' experiences of menstruation and schooling in Tanzania. *J Adolesc*, 33(4), 521-529. doi:10.1016/j.adolescence.2009.03.008
- Sommer, M. (2011). An overlooked priority: Puberty in Sub-Saharan Africa. *Am J Public Health*, 101(6), 979-982. doi:10.2105/
- Sommer, M. (2013). Structural factors influencing menstruating school girls' health and well-being in Tanzania. *Compare: A Journal of Comparative and International Education*, 43(3), 323-345.

- Sommer, M., Caruso, B. A., Sahin, M., Calderon, T., Cavill, S., Mahon, T., & Phillips-Howard, P. A. (2016). A Time for Global Action: Addressing Girls' Menstrual Hygiene Management Needs in Schools. *PLoS Med*, *13*(2), e1001962.
- Sommer, M., Hirsch, J. S., Nathanson, C., & Parker, R. G. (2015a). Comfortably, Safely, and Without Shame: Defining Menstrual Hygiene Management as a Public Health Issue. *American Journal of Public Health*, *105*(7), 1302-1311.
- Sommer, M., & Sahin, M. (2013). Overcoming the taboo: Advancing the global agenda for menstrual hygiene management for schoolgirls. *American Journal of Public Health*, *103*(9), 1556-1559.
- Sommer, M., Sutherland, C., & Chandra-Mouli, V. (2015b). Putting menarche and girls into the global population health agenda. *Reproductive health*, *12*(1), 24.
- Sumpter, C., & Torondel, B. (2013). A systematic review of the health and social effects of menstrual hygiene management.
- Tavrow, P., Withers, M., Obbuyi, A., Omollo, V., & Wu, E. (2013). Rape Myth Attitudes in Rural Kenya: Toward the Development of a Culturally Relevant Attitude Scale and "Blame Index". *Journal of interpersonal violence*, 0886260512471086.
- Thakre, S. B., Thakre, S. S., Reddy, M., Rathi, N., Pathak, K., & Ughade, S. (2011). Menstrual hygiene: knowledge and practice among adolescent school girls of Saoner, Nagpur district. *J Clin Diagn Res*, *5*(5), 1027-1033.
- Thakre, S. B., Thakre, S. S., Ughade, S., & Thakre, A. D. (2012). Urban-rural differences in menstrual problems and practices of girl students in Nagpur, India. *Indian pediatrics*, *49*(9), 733-736.
- Thomas, M. A., & Rugambwa, A. (2013). Gendered aspects of classroom practice *Teaching in Tension* (pp. 133-148): Springer.
- UNESCO. (2012). UNESCO Global partnership for girls' and women's education-One Year On: Kenya. Retrieved from http://www.unesco.org/eri/cp/factsheets_ed/KE_EDFactSheet.pdf
- UNESCO. (2014). *Good policy and practice in health education: puberty education and menstrual hygiene management*. Paris: UNESCO.
- UNESCO. (2015). *Education for All Global Monitoring Report*. Retrieved from Paris: <http://unesdoc.unesco.org/images/0023/002322/232205e.pdf>
- UNICEF. (2010). *Water, Sanitation, and Hygiene (WASH) in Schools*. Retrieved from New York: http://www.unicef.org/publications/files/CFS_WASH_E_web.pdf
- United Nations Economic and Social Council. (2016). *Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators*. Retrieved from <http://unstats.un.org/unsd/statcom/47th-session/documents/2016-2-IAEG-SDGs-E.pdf>.
- Unterhalter, E., & Aikman, S. (2007). *Practising Gender Equality in Education*. Oxford, England: Oxfam GB.
- Uwejamomere, T., & Northover, H. (2008). *Turning slums around: The case for water and sanitation*. Retrieved from London: <http://www.wateraid.org/~media/Publications/water-sanitation-slums.pdf>
- Viner, R. M., Ozer, E. M., Denny, S., Marmot, M., Resnick, M., Fatusi, A., & Currie, C. (2012). Adolescence and the social determinants of health. *Lancet*, *379*(9826), 1641-1652. doi:10.1016/s0140-6736(12)60149-4

- Wambugu, P. M., & Kyalo, P. (2014). The Level of Adequacy of Sanitary Facilities for Girls in Primary Schools of Nakuru Municipality, Nakuru County, Kenya. *International Journal of Academic Research in Business and Social Sciences*, 4(3), 193-203.
- WHO. (2014). *Exposure to Dioxins and Dioxin-like Substances: A major public Health Concern*. Retrieved from Geneva: <http://www.who.int/ipcs/features/dioxins.pdf?ua=1>

Appendix A: Key Informant Interview

Key Informant Interview		
Interviewer name: _____		
Date (dd/mm/yy): ___/___/___	Start time ___:___ am/pm	End time ___:___ am/pm
A. Basic Information		
<i>First, we would like to start by gathering some basic information about your school.</i>		
A1. School Name:	A2. School Identification code:	
A3. School Location:	A4. School Type: <input type="checkbox"/> 1: Public <input type="checkbox"/> 2: Private/Community	
What is your gender?	What is your position?	
School Population and Community Engagement		
Student population *A5. Student population <i>Indicate the number of girls and boys in each grade. IN THE COLUMNS FOR EACH GRADE, note numbers for the following categories: 1. Girls; 2. Boys; 3. Students with disabilities</i> A5.1 Class 1 _____ A5.2 Class 2 _____ A5.3 Class 3 _____ A5.4 Class 4 _____ A5.5 Class 5 _____ A5.6 Class 6 _____ A5.7 Class 7 _____ A5.8 Class 8 _____ A5.9 Total _____	A9. Teacher population A9.1 Total male teachers: A9.2 Total female teachers: A10. Does the school have a parent-teacher association (PTA) or equivalent? <input type="checkbox"/> 1: Yes <input type="checkbox"/> 2: No A12. Does the school have student-led organizations? <input type="checkbox"/> 1: Yes <input type="checkbox"/> 2: No <i>*If Yes, are any ...</i> A12.1 Health related? <input type="checkbox"/> 1: Yes <input type="checkbox"/> 2: No A12.2 WASH related? <input type="checkbox"/> 1: Yes <input type="checkbox"/> 2: No A12.3 Just for girls? <input type="checkbox"/> 1: Yes <input type="checkbox"/> 2: No A 12.4 Other/Comments	
*A1.1 Do students wear uniforms? *A1.2 If yes, Please describe the type and color of uniforms girls wear:		<input type="checkbox"/> 1: Yes <input type="checkbox"/> 2: No

B. Questions about Water

Now I would like to gather some information on your school's water resources.

#	Question	Response

1)	What is the school's main water source?	Piped water into school building.....1 Piped water into schoolyard/ plot.....2 Public tap/ standpipe.....3 Tube well / borehole.....4 Rainwater collection.....9 Bottled water.....10 Cart with small tank/ drum.....11 Tanker truck.....12 Students bring water to school from their homes.....14 No water available in /near school..... SKIP to B515 Other (please specify)88 _____
2)	What is the water source used for? (<i>Check all that apply</i>)	Drinking.....1 Hand washing.....2 Anal cleansing after defecation.....3 Flushing or pour-flushing toilets.....4 Cooking.....5 Personal hygiene, bathing.....6 Latrine cleaning.....7 Other (please specify)88 _____
3)	Is water currently available from that source?	Yes SKIP to B61 No.....2 Don't know.....99
4)	How often is the water source functional?	5-7 days per week1 2-4 days per week2 Fewer than 2 days per week3
5)	Is the main water source functional now?	Yes SKIP to B61 No.....2 Partially.....3
6)	How far away is the school's current water source?	The current water source is on school grounds.....1 The current water source is ____ meters away.....2 Water brought from home.....3
7)	When the water source is functional, does it provide enough water for the needs of the school, including water for drinking and hand washing?	Yes1 No.....2 Don't know.....99
8)	If the main water source is not functional or only partially functional now, how long has it been not/partially functional?	Less than one day1 More than one day and less than one week.....2 More than one week and less than one month.....3 One month or more4

9)	Is there an alternative school water supply available when the main supply is non-functional?	Yes (<i>Please Specify</i>).....1 _____ No.....2 Don't know.....99
10)	Does the alternative water source meet both basic drinking and hand-washing needs? (5 Liters per day)	Yes1 No.....2 Don't know.....99

C. Sanitation Questions for the Teacher

1)	Are there toilets/latrines at the school?	<input type="checkbox"/> 1: Yes <input type="checkbox"/> 2: No → SKIP to C12
2)	Does the school have specified times when students are allowed to visit the latrines?	<input type="checkbox"/> 1: Yes, they can only go at breaks <input type="checkbox"/> 2: Yes, but can go at other times <input type="checkbox"/> 3: No, they go as they need
3)	Does the school have any private facilities for girls to bathe/wash themselves (such as a tap and basin inside a lockable toilet stall)?	Yes1 No.....2
4)	Does the school have any private facilities for girls to wash cloth napkins (such as a tap and basin inside a lockable toilet stall)?	Yes1 No.....2
5)	Does the school have any incineration facilities for disposable napkins?	Yes1 No.....2
6)	Does the school have any private disposal dustbins inside the latrines for disposable napkins?	Yes1 No.....2
7)	Does the school have any anal cleansing materials available in the latrine / toilet stalls (e.g. water, tissue)?	Yes1 No.....2

D. Waste disposal and drainage observations

1)	How is solid waste (garbage, rubbish) disposed at the school? (<i>Check one</i>)	Thrown on a garbage dump within or near school grounds...1 Buried within or near the school grounds.....2 Burned within or near the school grounds3 Collected and taken away by a waste disposal service4 Other88 Don't know.....99
2)	How often is solid waste disposed of or collected?	At least once a day1 Between once every two days and once a week2 Less frequently than once a week3 Other (please specify)88 _____ Don't know.....99

3)	If the school has an on-site sanitation system (pit latrines, composting toilet, septic tank), is there a schedule for emptying and disposing of the waste?	Yes1 No.....2 Not Applicable.....98 Don't know.....99
4)	Is the waste disposed of safely?	Yes1 No.....2 Not Applicable.....98 Don't know.....99
5)	Where is the waste disposed of?	

E. Operation and maintenance questions for the teacher

Water facilities

6)	To your best knowledge, what entity has the primary responsibility for maintenance and repair of the school water system ?	The Ministry responsible for water supply.....1 The District or Municipal authorities2 The Ministry of Education3 The school itself4 Other (please specify)88 <hr/> Not Applicable.....98 Don't know.....99
7)	In your opinion, are the school water facilities successfully maintained and repaired when required?	Yes1 No.....2 Partially.....3 Not Applicable.....98 Don't know.....99
8)	To the best of your knowledge, what entity has the primary responsibility for operation of the school water system?	The Ministry responsible for water supply.....1 The District or Municipal authorities2 The Ministry of Education3 The school itself4 Other (please specify)88 <hr/> Not Applicable.....98 Don't know.....99
9)	In your opinion, are the school water facilities successfully operated ?	Yes1 No.....2 Partially.....3 Not Applicable.....98 Don't know.....99
10)	If the <i>water supply system is not functional or is only partially functional at the time of the visit</i> , what are the main reasons?	Unclear responsibilities for operation/ maintenance.....1 Poor operation and/or maintenance practices.....2 Lack of spare parts3 Lack of operation consumables (fuel, electricity, etc.).....4 Poor initial design of system5 Age of system6 Latrine cleaning.....7 Other (please specify)88

		Not Applicable.....98 Don't know.....99
13)	Who is primarily responsible for fetching/collecting water for all water-related activities at the school	Girl students.....1 Boy students.....2 Female teachers.....3 Male teachers.....4 Other (please specify)88 <hr/> Not Applicable.....98 Don't know.....99

Sanitation Facilities		
1)	To the best of your knowledge, what entity has the primary responsibility for maintenance and repair of the school sanitation facilities ?	The Ministry responsible for water supply.....1 The District or Municipal authorities2 The Ministry of Education3 The school itself4 Other (please specify)88 <hr/> Not Applicable.....98 Don't know.....99
2)	In your opinion, are the school sanitation facilities successfully maintained and repaired when required? (<i>Check one</i>)	Yes1 No.....2 Partially.....3 Not Applicable.....98 Don't know.....99
3)	Within the school, who is responsible for cleaning the school toilet facilities? (<i>Check all that apply</i>)	Girl students.....1 Boy students.....2 Custodial Staff.....3 Teachers.....4 No one is responsible.....5 Other (please specify)88 <hr/> Not Applicable.....98
4)	If students have some toilet cleaning responsibilities, what are the respective responsibilities of girls and boys? (check all that apply)	Girls usually clean their own toilets1 Boys usually clean their own toilets.....2 Girls usually clean boys' toilets.....3 Boys usually clean girls' toilets.....4 Boys usually clean teachers' toilets5 Girls usually clean teachers' toilets6 Other (please specify)88 <hr/> Not Applicable.....98 Don't know.....99
5)	What are the punishments assigned to students? (let them list, is toilet cleaning a punishment?)	Yes1 No.....2 Sometimes.....3

Are toilet-cleaning duties assigned to students as punishment for misbehavior or poor school performance?	Not Applicable.....98 Don't know.....99
---	--

F. General hygiene questions for the teacher	
1) Is hygiene taught at the school?	Yes1 No (Skip to D6).....2
2) How is hygiene taught at the school? (<i>Check all that apply</i>)	As a component of the core curriculum (e.g. in science class).....1 As an integral part of a special module on healthy living/ life skills.....2 As a stand-alone special module on hygiene exclusively.....3 Through a school-sponsored extracurricular program (e.g. sanitation clubs)...4 Only sporadically/informally/occasionally.....5 Other: _____ 88
3) Is hand washing with soap a prominent part of hygiene lessons? (<i>Check one</i>)	Yes1 No.....2 Partially.....3 Not Applicable.....98 Don't know.....99
4) Is the importance of the use of soap (or ash) when hand washing stressed in the hygiene education material?	Yes1 No.....2 Partially.....3 Don't know.....99
5) Is the importance of hand washing with soap (or ash) at critical times stressed in the hygiene education material?	Yes1 No.....2 Partially.....3 Don't know.....99
6) Do you have any designated times for students to wash their hands? (let them list)	Yes1 No.....2 Partially.....3 Don't know.....99
7) Are students encouraged to transmit hygiene knowledge to their families and communities?	Yes, through the hygiene lessons and/or education material that encourages students to talk about or demonstrate good hygiene practices at home.....1 Yes, through REGULAR school-sponsored outreach events (e.g. plays/songs on hygiene by students for parents visiting the school, community surveys conducted by students, etc.).....2 Yes, but only sporadically/informally/occasionally.....3 No.....4 Other.....88 Don't know.....99

PART 2: MHM-Specific Information	
*G. Menstrual hygiene questions for the teacher	
NOTE: Please put the recorder on for the final portion of this interview.	
1)	Do girls receive menstruation-related education at the school? Yes1 No (Skip to G5).....2
2)	If yes , how is menstruation-related education taught at the school? As a component of the core curriculum (e.g. in science class).....1 As an integral part of a special module on healthy living/ life skills.....2 As a stand-alone special module on hygiene exclusively.....3 Through a school-sponsored extracurricular program (e.g. clubs).....4 Only sporadically/informally/occasionally.....5 Other: _____88
3)	If yes , who teaches menstruation-related education at the school? Teachers.....1 School nurses or health teachers.....2 Parents from the community.....3 Community health workers.....4 Other.....88
4)	If yes , can you explain what is covered in the education session? (Use use as open ended questions with listed responses as probes) Information provided is about biological reasons for menstruation.....1 Information provided teaches girls about managing menstruation, hygiene, how to clean/use cloths, etc.....2 Information provided includes information about reproductive health.....3 Other: _____88
5)	If yes , explain when and how often girls receive menstruation-related education? (Take notes, record response) _____
6)	If yes , at what age and grade do girls start receiving this information? Age ____ Grade ____
7)	Are teachers at this school trained on menstrual health and hygiene promotion/education? Yes1 No.....2 Don't know.....99
8)	If yes, please tell me about the training. (Take notes, record response)
9)	Are menstruation-related education materials available and accessible to girls at the school? Yes1 No.....2 Don't know.....99
10)	Are sanitary napkins available for girls at the school on a regular basis? Yes1 No.....2 Don't know.....99
11)	If yes , Who funds? Do girls pay for them? How are they distributed? Do girls need to ask for them?
12)	Are sanitary napkins available for girls at the school in an emergency/accident situation? Yes1 No.....2 Don't know.....99

13)	<p>If yes, how are they made available? <i>(Take notes, record response)</i> <i>Probe: Who funds? Do girls pay for them? How are they distributed? Do girls need to ask for them?</i></p>
14)	<p>How do you think most teachers feel about teaching menstruation to girls in school? If not taught, ask how they think teachers would feel if asked to teach about menstruation related topics. Probe: <i>Difficulty of topic, the role of others to teach, male teachers feelings vs. female teachers feelings</i></p>
15)	<p>Can you tell me if girls are expected to come to school while menstruating? Probe: <i>why, do girls abide by these expectations, what do girls' parents think, etc.</i></p>
16)	<p>In many schools, girls get teased if it is known they are menstruating. Can you tell me the extent to which this happens at this school? Probe: <i>Who teases?; Why is there teasing?; Are those teasing ever disciplined?; Do boys receive education?</i></p>
17)	<p>Can you tell me how girls' behaviours may change when they are menstruating? Probe: <i>class/activity participation, leaving school, missing school, distraction, class behaviours, etc.</i></p>
18)	<p>In many schools, girls miss school or leave school early when they are menstruating. How often does that happen at this school? Probe: <i>frequency, certain girls only/specifically, etc.</i></p>
19)	<p>What do you think schools can do to make it easier for girls to be in school during menstruation? Probe: <i>education, facilities, support, resources, etc.</i></p>

Appendix B: Focus Groups Discussion Guide

Focus Groups with Girls

Thank you for meeting with me today! My name is Candace, and I am from the United States. I am in school, but I am here in Kenya for a class project. I am trying to understand the ways that girls manage their MP at school. I want to talk with you, because you are the experts on my topic. I would like to hear many different views, and no idea is wrong or bad. For me, it is even ok if you disagree with your friends. All of your ideas, experiences and opinions are important to me. What you say here, will help girls like you from all over Mukuru. You do not have to participate in this talk if you do not want to. I will be recording our conversation so that I can remember what you say later.

There are a few things that I would like you to remember during this talk.

1. Please, only one person should talk at a time. If possible, I would like you to say your name before you speak.
2. What you say here should remain here so that we can trust that this room is a safe place for us to say what we feel.

Ice-Breaker: Ask girls to sing a few songs and play "The Name Game" (i.e. my name is Candy and I like Cake)

1. State your name again, what do you like most about being in school?

Background Questions	
Questions	Probes
1) Can you describe a typical day for students starting when you arrive at school?	<ul style="list-style-type: none"> • What time do you come to school? • How long is your day at school? Are there any breaks? • Do students ever go home during the day?
2) Can you tell me about what the latrines/facilities were like before FLTs?	<ul style="list-style-type: none"> • How many were there? • Separate latrines for boys and girls? • Cleanly? Smell? Privacy? Safety? • Soap/water/materials available for personal hygiene? • Do girls prefer going with friends? • Could you dispose of personal supplies? How?
4) Can you all explain any school rules regarding latrine use?	<ul style="list-style-type: none"> • Do all students use the latrines? • Are places besides the latrine used? Where? Why? • When can students use latrines? Breaks? During class? • Are latrines ever kept locked? Accessible? • If hauling water is needed, who does this? • Who cleans the latrines?
4) Does your school have a school WASH club or WASH prefects?	<ul style="list-style-type: none"> • What does your WASH club do? • What does the WASH prefect do? • Would they be interested in reporting on the FLT's? • How do you feel about Fresh Life operators coming to your school?

Ideal Place for Your Period	
Facilitator: <i>I want to understand what is most important for a place you feel comfortable managing your period. So we are will do an activity to help us think about that place.</i>	
Preparation instructions for the facilitator: 1. Provide girls with sheets of paper to draw on. Make sure that the paper is accessible to everyone. 2. Provide each girl with a marker	
Activity Steps	Probes
<i>I would like you to think about the perfect place to manage your period at school. If you did not have to worry about money or space what would this place look like? You may draw a picture with labels, or write a paragraph if you feel more comfortable.</i>	<ul style="list-style-type: none"> • Characteristics of stall, & the block • location • distance from classrooms • Ventilation • Access to water. • Water drainage • Disposal
<i>Now I would like you to present your pictures to the group.</i>	<ul style="list-style-type: none"> • Describe the privacy • Who will see you go inside? That's ok? • Who uses this place? Boys? Younger children? • How do you feel about blood on the toilet/tiles? • Can she wash you pads or skirts here? • Can she wash her body here? Does she need to?
<i>Based on your drawings, how does your school compare?</i>	<ul style="list-style-type: none"> • What is the same as your school? • What is different? • What things are most important to you? • How would you feel about having blocks? An extra room? • What should the blocks look like? • Would it be ok to have a bucket instead of a bin? Is the bin too small?

Imagining the life of a normal girl	
<i>Now we are going to Tabitha. A pupil who goes to a school just like yours. I'm going to tell you a story about her, and then we are going to talk about what she should do. Tabitha is a girl in class six. She goes to school one morning, and after one hour of her first class, she realizes that she got her period. (this is not her first time)</i>	
Questions	Probes
1. How do you think Rosita feels when she realizes she has her period? <i>Attitudes/emotions:</i> Excitement, fear, stress, confusion?	<ul style="list-style-type: none"> • What is the first thing Rosita does once she realizes she has her period? <ul style="list-style-type: none"> • Where does she go? • Who does she talk with? Why? • Would she feel comfortable talking to another student if she's not comfortable talking to a teacher? • Why? • Why not? • Are there girls who don't feel comfortable talking to anyone?

	<ul style="list-style-type: none"> • What kinds of materials does Rosita use? Why not something else? <ul style="list-style-type: none"> ○ Does Rosita like to use these materials? Are they comfortable? Preferred? ○ What is done with these materials after they are used? ○ What does she use at home? Why? • Where does she get materials? Brought from home, a friend, school, a shop? • Does Rosita usually have money to buy pads herself? • Where does Rosita get money? <ul style="list-style-type: none"> • What are other places she can get money? • If there was a place to buy pads at school instead of talking to the teacher, would Rosita want to do that?
<p>2. How does her period change her normal day? Does she experience any restrictions at home, school, religious centers or anywhere else?</p>	<ul style="list-style-type: none"> • How does her day at school change? • How does she behave in class? <ul style="list-style-type: none"> ○ How does she participate? • What will she do if she is having pain? • How does she act with classmates, friends, and teachers? • Is she tardy? Does she leave school? • If she stains her skirt, where does she wash it?
<p>3. How does Rosita feel throughout the day?</p>	<ul style="list-style-type: none"> • Is it a surprise that her period arrived? • Has she prepared? Brought materials? Tracked her period? <ul style="list-style-type: none"> ○ <i>Support:</i> Has she talked to someone about this day? • How do you think Rosita learned to manage her period? <ul style="list-style-type: none"> ○ Family or friends? School? Education? ○ What strategies does Rosita use during the day? • What might make Rosita’s classmates suspect that she is having her MP? <ul style="list-style-type: none"> ○ Behaviours in class? With friends? ○ Latrine use? ○ Different clothing? • How might people’s behaviour towards Rosita change if they know she has her period? <ul style="list-style-type: none"> ○ Teasing? Avoidance? Exclusion? From teachers, family, peers, friends? • Which people at the school does Rosita feel comfortable talking to about menstruation? <ul style="list-style-type: none"> ○ <i>Support:</i> Why those people and how are they different from others? • <i>Non-supportive:</i> If there are no people, why? Who would Rosita not want to know? Why?

4. If Rosita needs to wash her skirt, what does she do?	<ul style="list-style-type: none"> • Where does she go? • Does she always go home? • How does she do it? • How could this be better?
Conclusion	
1. Can you think of any other challenges Rosita may face?	<ul style="list-style-type: none"> • <i>Sanitation/latrines?</i> • <i>Information? Pads/materials?</i> • <i>Teasing? Physical pain?</i> • <i>Emotional feelings?</i>
2. Of all the challenges listed here, what do you think are the most difficult challenges at school?	
3. For the most difficult challenges, what do you think can be done to make each one easier?	

Appendix C: School Facility Observation

School Facility Observations			
A01. Research Assistant name:	A02. Date (dd/mm/yy): ___/___/___	A03. Start time ___:___ am/pm	A04. End time ___:___ am/pm
Basic School Information			
A1. School Name:		A2. School Identification code:	
*A1.1 Do students wear uniforms? <input type="checkbox"/> 1: Yes <input type="checkbox"/> 2: No			
*A1.2 If yes, Please describe the type and color of uniforms girls wear:			

C. Sanitation observations

NOTE: You may need a teacher or student to help you.

C01. Are there toilets/latrines at the school?

- 1: Yes
 2: No → **SKIP to C12**

Definitions:

Toilet compartment- an individual stall/seat/open pit/squat plate where a single child can defecate in private (not urinals).

Functionality

- 1. Functional** – toilet facilities are not physically broken and can be used.
- 2. Partially functional**– toilets can be used, but there are at least some problems with the physical infrastructure and some repair is necessary.
- 3. Not functional** – toilets exist, but are so badly damaged or deteriorated it is no longer reasonably possible to use them
- 4. Don't know**-Unable to assess because locked from the outside

Cleanliness

- 1. Clean** – toilet compartments are not smelly; there are no visible faeces in or around facility, no flies, no litter.
- 2. Somewhat clean** – there is some smell and/or some sign of faecal matter/urine and/or some flies and/or litter.
- 3. Not clean** – there is a strong smell and/or presence of faecal matter and/or urine and/or significant fly problem and/or large amount of litter.
- 4. Don't know**-Unable to assess because locked from the outside

Light

- 1. Light** – vision is essentially the same on the inside as it is on the outside.
- 2. Somewhat dark** – there is less visibility on the inside, but it is still possible to see clearly. Girls could look at their uniforms and tell if there is a stain.
- 3. Dark** – toilets and latrines are very dark on the inside. It is really hard to see. It would be difficult for girls to look at their uniforms and tell if there is a stain.
- 4. Locked**- Locked from the outside

C12. How many urinals are there?

C11_1: For Boys _____

C11_2: For Male teachers _____

C11_3: For Girls _____

C11_4: For Female teachers _____

C11_98: Not applicable (no individual urinals)

C13. If there are continuous urinal walls/gutters, what is the total length (meters)?

C12_1: Boys _____ m

C12_2: Male teachers _____ m

C12_3: Girls _____ m

C12_4: Female teachers _____ m

C12_98: Not applicable (no continuous urinals)

D. Waste disposal and drainage observations

D1.1 At the time of the visit, are the waste pits/composting chambers/septic tanks obviously too full or overflowing?

- 1: Yes, in all facilities visited
- 2: Yes, in more than 50% of the facilities visited
- 3: Yes, but only in 50% or fewer of the facilities visited
- 4: No in none of the facilities visited
- 5: Unable to observe

***D1.2** At the time of the visit, did you see a pit for burning used sanitary towels?

- 1: Yes 2: No

***D1.3** At the time of the visit, did you see an incinerator for burning used sanitary towels?

- 1: Yes 2: No

D2. Does the school have a drainage system for removing wastewater from the school grounds? (You may have to verify with teacher. Drainage should include provision for removing storm water, 'grey water' from hand-washing stations, etc.)

- 1: Yes 2: No **→SKIP to Section E** 3: Yes, but only a partial or incomplete system

D3. *If yes*, is the drainage system functional at the time of the visit?

- 1: Yes 2: No **→SKIP to Section E** 3: Partially