

**Utilizing participatory and quantitative methods
for effective
menstrual-hygiene management related policy and planning**

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**Paper for the UNICEF-GPIA Conference
April 24-26th, 2010
New York**

Introduction

Recent debate exists on the importance and necessity of addressing adolescent girls menstrual-hygiene management related needs in school settings in low-income countries. Given the limited resources that exist at both the national and global level for effective education and health-related interventions, social and fiscal policies must rely on the best evidence to date to direct country-level programming. However too little attention has been given to the structural and environmental context of pubescent girls' school-going experiences, including the combined impact of absent and/or inadequate water and sanitary facilities, male-dominated administration and staffing, and insufficient girl-focused guidance on the pragmatics of managing pubertal (and menstrual) body changes in a coed school environment. These challenges may be particularly acute for economically-disadvantaged girls across low-income countries, who, due to situations of poverty, may attend the least girl-friendly school environments, lack sufficient sanitary materials to manage their menses en route to and in school, and come from families who perceive the onset of menstruation as an appropriate age at which to withdraw a girl from school for reasons of early marriage, household care-taking, and/or income-generating activities. The sensitive nature of the topic (menstruation) can pose challenges to utilizing particular research methods, emphasizing the importance of local collaborations and the incorporation of a range of research methods to assure the most valid set of data is acquired. Capturing girls' voiced experiences of this transition through puberty and menstrual onset through the use of participatory methods, coupled with demographic and quantitative data that enable the generalization of findings to national education and adolescent health policy, is critical and long overdue. A review of the evidence to date on menstrual-hygiene management research,

programming and policy, and on remaining gaps in menstrual-related research and recommended methodological approaches, is the subject of this paper.

The onset of menstruation

Early adolescence, defined here as 10-14 years old, brings with it significant physiological changes, and social and cultural pressures for girls growing up around the globe (Brooks-Gunn & Petersen, 1983; Buckley & Gottlieb, 1998; Mensch, Bruce & Greene, 1998; Van de Walle & Renne, 2001). The transition through pubertal body changes, both the visible aspects of maturation such as hip widening and breast development, and the internal and oftentimes confusing emotional changes that occur, introduce new challenges for girls' daily activities in societies where traditional guidance and practices may be diminishing, and globalizing influences seeping into everyday life (Burrows & Johnson, 2005; Chrisler & Zittel, 1998; Sommer, 2009a). In particular, the onset of menstruation, and the need for bodily self-management around menstrual blood flow in the private (household) and public (market, school) spheres, requires a natural but new set of behaviors from girls. Laws (1990) describes how girls are taught "menstrual etiquette", or self-management approaches to successfully hiding menstrual blood flow from public, and particularly male, view while going about their daily activities. The existence of a societal menstrual etiquette, and its implications for schoolgirls, can be found in countries and cultures throughout the world where adolescent girls and women manage monthly menstrual flow, oftentimes in strict secrecy, while doing agricultural work, fetching water or firewood, conducting business in shops, or working in government offices. Menstrual etiquettes may vary greatly depending on the particular social, cultural and economic context, as does the induction of girls into the pragmatics of following such etiquettes.

In some societies, such as the Dogon in Mali, the Havik Brahmins of South India and innumerable others, menstrual taboos are reported to limit girls and women's participation in activities such as cooking, prayer, and agricultural chores (UNFPA, 2003; Strassman, 1992; Ullrich, 1992), with the underlying beliefs being that girls and women are unclean during monthly menses, and/or that menstrual blood has the power to inflict harm on others nearby (Douglas, 1996). Although such menstrual restrictions have been well documented, social scientists have more recently challenged the universal notion of menstrual taboos, suggesting that restrictions on girls' and women's behavior during monthly menstrual flow may, for example, in some contexts be a societal or cultural arrangement allowing rest from the usual heavy burden of household labor (Buckley & Gottlieb, 1998; Van de Walle & Renne, 2001). Regardless of the meanings behind the perceived and existing menstrual taboos or etiquettes, there are in most societies behavioral changes expected of girls once menstrual onset has begun, particularly around body self-management, with potential implications for schoolgirls who must practice menstrual-hygiene management in potentially girl unfriendly school environments.

The conveyance of menstrual-related information (e.g. beliefs, taboos, management) to girls prior to or upon reaching menarche (or even afterwards) is also culturally specific. In previous decades, anthropologists in particular documented evidence about pubertal rites in various ethnic groups, such as ceremonial traditions, the role of menstrual huts and seclusion, and correlations to fertility (Bharadwaj & Patkar, 2004; Brown, 1932; Kandel, Bhandari & Lamichanne, accessed April 2010). Although in many societies it is older women in the family, such as aunts, grandmothers and sisters who convey guidance to newly menstruating girls (and not mothers), in other contexts no guidance is provided, and girls are expected instead to seek out information from siblings and friends, and more recently, school teachers (Roth-Allen, 2000;

Sommer, 2009b). The accuracy of such guidance, particularly when conveyed from peers, is less well known. Since girls and women did not traditionally have to stay in confined settings with boys and men during their monthly menses, such as school environments today, it is also less well known how appropriate traditional menstrual management guidance is for enabling girls to manage their menses comfortably for prolonged hours in coed settings. Indeed, preliminary evidence from a menstrual-management project in Ethiopia suggests fear of bullying by boys is a primary factor in menstruating girls' decisions to miss school (ICOWHI, 2010). Social scientists working in education have documented the ways in which compulsory formal education in some sub-Saharan African countries has led to pressures on ethnic groups to modify the content and timing of pubertal rites and traditions (Mibilinyi, 1998; Mwanalushi, 1979), potentially leaving girls with reduced guidance on menstrual meanings and menstrual-hygiene management. In public health, researchers have explored the conveyance of pubertal (often reproductive health related) guidance to girls, focusing primarily on the implications of pubertal onset for contraceptive use, unplanned pregnancy, and reproductive health outcomes (Bledsoe & Cohen, 1993; Zabin & Karungari, 1998), and to a lesser extent, on the intersection of menstrual onset and education for girls. The latter research on menses and schooling has, however, suggested that the combination of fading traditional practices and urban migration separating extended families, such as girls moved far from their aunts and grandmothers, may leave some girls less well prepared for the pragmatics of managing menses in school (FAWE, 2008; Sommer, 2009b).

Insufficient data exists on the current practice of pubertal rites in most societies, on the conveyance (and appropriateness for school-going needs) of traditional menstrual-related guidance, on the influence of urban migration and the globalized media and markets on girls' transitions through puberty, and on what gaps in pragmatic menstrual hygiene-management

knowledge girls may be facing in different societies as they attempt to pursue their schooling. Understanding in each local context what the meanings and beliefs are around monthly menses, and the etiquette-related behaviors conveyed to newly menstruating girls, is an important part of building the evidence base for menstrual-hygiene management in schools.

The girl unfriendly school context

In the last two decades, the global education community has made tremendous strides in the effort to close the gender gap in education, with particular success in narrowing the primary school gender gap in South Asia, the Middle East and West and Central Africa (Lloyd, 2007). Nevertheless, the gender gap remains, particularly in sub-Saharan Africa, with primary school completion rates lower than 50% in many countries, and the gender ratio of girls to boys continuing on to secondary level school being 80:100 (Lloyd, 2009). The population health benefits to be achieved from educating girls through the primary and secondary level are undisputed (Herz & Sperling, 2004; LeVine, LeVine, Rowe et al, 2004), alongside of the basic right that girls have to a quality education in a safe and non-discriminatory environment. The global education donors, along with education researchers and practitioners, and national governments have put extensive efforts into exploring the various barriers hindering girls' school attendance, and much evidence and documentation currently exists (Lloyd, 2009; Temin & Levine, 2009; Herz & Sperling, 2004). The latter research provides essential guidance for education policy and programming prioritization per the available resources, and also allows for the identification of gaps in the existing empirical evidence.

Two of the barriers the global education community has identified for girls' successful pursuit of an education are of particular relevancy to menstrual-hygiene management. These barriers include: one, the need for appropriate water and sanitation in schools, with a particular

emphasis on having separate latrines for girls and boys; and two, the role of gender bias in school curricula and teacher behavior that inhibits girls' educational success in the classroom and school atmosphere. Both are frequently cited in various United Nations (UN) reports and calls to action, and the annual reports of the World Bank, bi-lateral donors, and a growing number of national education policies in low-income countries (UNESCO, 2007; World Bank, 2005; UNICEF, 2006). These barriers may act synergistically in augmenting the hurdles for menstruating girls' school attendance and participation, and are structural factors within the school context that are in need of more overarching social, political, and economic approaches to solve. These two barriers do not entirely explain the challenges related to menstrual-hygiene management that are faced by girls in particular contexts, and additional data is needed on the specific aspects of local school environments within particular countries that may hinder menstruating girls' school-going abilities, and the interventions that would be most appropriate to improving menstruating girls' comfort level and participation in school. The latter information must be drawn from girls themselves, and not just from the adults who interact in girls' lives, as only girls can truly know what will enable and empower them to feel comfortable en route to and in school amongst their peers and teachers.

The "girl unfriendly" school environment as it relates to menstrual-hygiene management has been described as one in which there are a number of dissatisfactory components for successful (or comfortable) menses management (Kirk & Sommer, 2005; Sommer & Kirk, 2008; El-Gilany, Badawi & El-Fedawy, 2005). Although insufficient country specific data still exists, a range of non-governmental organizations (NGOs), local African women's organizations, United Nations entities such as UNICEF, and a growing number of academic researchers, have analyzed and explicated what makes a school environment girl unfriendly. The problematic

components include: One, school environments where there is a complete lack of latrines or where available latrines are inadequate in terms of their number, their quality, their design, their nearness to boys' latrines, the safety of their location, and the privacy they provide, including locks on the inside of latrine doors. Two, school environments where there is an absent or insufficient availability of (clean) water, and more specifically, where water sources are located at a distance from sanitation facilities (latrines, toilets), and when water is not located inside the latrines/toilets themselves, for private washing of hands and menstrual stains. Three, school environments that lack adequate disposal mechanisms for used sanitary materials, including a lack of dustbins inside the latrine/toilet, and/or an absence of a means for disposing used sanitary materials outside the latrine, such as an incinerator or a pit for burning (although each and every locale must determine what disposal mechanisms are culturally appropriate). For those girls who re-use sanitary cloths, a school environment that lacks a private space for washing out of cloths, drying them covertly in the sunshine, and ironing. Four, a school environment that is either predominantly male teaching staff and administration, and hence less attuned to the needs of menstruating girls or who are simply culturally inappropriate for providing such support; or an environment that has both male and female teachers, but who are not sensitized to the needs of menstruating girls. As with the other components, local taboos around discussing menstruation are critical to understand in order to adequately respond to this girl unfriendly component.

Although other aspects of school environments may be girl unfriendly, the above are highlighted as key aspects of schools that may hinder menstruating girls' attendance and participation. Additional challenges that may exist include an absence of nurses or trained teachers who may be able to provide sanitary materials to a girl when she has a menstrual accident and is unprepared; a private room where girls may lie down and rest if they experience

excessive menstrual cramps; and if deemed culturally appropriate, staff or nurses who can provide pain analgesics to girls who are experiencing menstrual-related discomfort.

Numerous girls in low-income countries throughout the world attend and participate in schools successfully despite the existence of girl unfriendly school environments. The anecdotal and burgeoning empirical literature suggests however that some girls are facing interruptions in their successful pursuit of an education due to the above-mentioned challenges, and for many girls, insufficient sanitary materials (such as good quality cloths or sanitary pads) (Scott, Dopson, Montgomery et al, 2009; Kristoff, 2009; Binka, 2003). There is a great need for additional empirical data to be provided on girls' school-going in specific contexts, including girls in rural versus urban environments; girls commuting long distances versus those attending boarding schools or nearby day schools; girls from lower versus higher income families; girls attending primary versus secondary level schooling; and girls who come from a range of ethnic backgrounds that may have very different beliefs about menstrual meanings and management, and different perceptions about what types of school settings would be acceptable for an adolescent girl. Assuring that school environments are non-discriminatory, and enable the equal pursuit of education for both girls and boys, is a fundamental aspect of narrowing further and ultimately closing the continued gender gap in education.

Addressing menstrual management in schools: Research, Policy and Programming

A growing number of NGOs, UN agencies, donors, researchers, and private sector entities are responding to the challenges girls face in attending school during monthly menses. Some of this response has been based on the extensive anecdotal information emerging from girls and teachers about the particular hurdles they face in attending school while managing menses in various cultural and economic contexts. However there have been a small number of

more in-depth research studies exploring this issue over the last decade, with increasing global interest in acquiring more wide-scale and valid data in recent years (Oster & Thornton, 2009; Scott, Dopson, Montgomery et al, 2009; Sommer, 2009b). Sound policy and programming on menstrual-hygiene management, as with other education and health interventions, should be based on quality empirical evidence that can bring on board national governments, and assure the appropriate prioritization of resources to support interventions. A range of research methods may be utilized to gather such evidence, with the research questions and context guiding the selection of appropriate methodologies.

A review of the existing menstrual-related evidence

A review of the menstrual-related evidence from low-income countries remains limited in terms of specific research conducted on the intersection of menstrual hygiene and girls' education, and will be discussed below. There also exists a body of literature on topics that are more indirectly related to the question of menstrual-hygiene management for school girls but that are nevertheless relevant to the topic, and that can provide contextual information for researchers designing research on menstrual-hygiene management in specific countries or local settings. Such research includes the literature on adolescent sexual and reproductive health (SRH), such as the school-based intervention explored by Plummer et al (2006) in Mwanza, Tanzania that provides insights into young people's SRH beliefs and practices; the findings documented from the provision of sex education by the NGO BRAC to adolescents in Bangladesh (Rashid, 2000); the randomized health education intervention initiated by Mbizvo et al (1997) in Zimbabwe which provides evidence of the need for early school-based reproductive health education; and the mixed-methods research conducted by Munthali and Zulu (2007) in Malawi, exploring the timing and role of initiation rites in preparing young people for

adolescence. All of these, and related studies, provide insights into gaps in girls' SRH knowledge, and potential intervention approaches for enhancing existing knowledge.

Additional research of relevance emerges from the anthropological field, where studies such as Castaneda et al (1996) explore the meanings of menstruation in rural Mexico, and Garg et al (2001) explored the socio-cultural aspects of menstruation in urban slums in Delhi. Both of the latter types of studies can help to guide research on menstrual-hygiene management for schoolgirls in those countries, providing important ethnographic background on girls' growing up experiences, and how menstrual beliefs may be changing as urban migration shifts family dynamics and the conveyance of traditional menstrual-related meanings and practices. Understanding existing attitudes towards menstruation in a given society are also of importance for researching and then addressing menstrual-hygiene management in school policy and programming. Examples from the existing literature include the cross-sectional descriptive study conducted by Adinma and Adinma (2008) that explored perceptions and practices of menstruation among Nigerian secondary school girls; the research conducted by El-Gilany et al (2005), who explored menstrual hygiene practices among school girls in Egypt; and the study by Marvan and Bejarno (2005) that utilized surveys of Mexican girls and teachers to better understand the preparation girls receive about menstruation at school.

Data on the average age at which menarche is reached in a particular society (including trends in menarcheal age) are also important for researching menstrual-hygiene management priorities for schools, given the guidance such information provides on timing of interventions. There currently exists a dearth of empirical evidence on the average age of menarche in low-income countries. The Demographic and Health Surveys (DHS), large household surveys conducted in many sub-Saharan African, Asian, Latin American and Caribbean countries every

five years include questions on age of first marriage, first childbirth, and even the age of menopause, but across sub-Saharan Africa have tended not to include questions that specifically ask about age of menarche (with a few exceptions such as Uganda). A few small-scale studies exist, such as Skandham et al (1988), who investigated girls' prior knowledge and knowledge upon reaching menarche in India, however such studies remain within an almost non-existent body of literature (not including the much more extensive body of literature from higher income countries). Lastly, there is a literature on dysmenorrhea or menstrual disorders, which provides some context for understanding what to inquire about in terms of menstrual-related discomfort that may be disrupting girls' school attendance, rather than menstrual-hygiene management specifically. Research includes that of Walraven et al (2002) who explored menstrual disorders in rural Gambia, although the focus was more on adult women than girls. The majority of studies found in this related body of literature are unfortunately of lower quality, and therefore of less usefulness to devising the content of future menstrual-hygiene management research.

A review of the existing intersecting menstruation and education evidence

The relatively small body of literature exploring the specific intersection of menstruation and girls' education includes a series of case studies funded by the Rockefeller Foundation in 2000, that explored sexual maturation for both boys and girls in Zimbabwe, Uganda, Kenya and to a smaller extent, Ghana (Stewart, 2004; Kirumira, 2004). This series of case studies provided insights for the Forum of African Women Educationalists (FAWE), Ministries of Education, and other local organizations to better understand how girls' schooling may be disrupted by the onset of menses, and from a qualitative perspective, what teachers, school administrations, and girls were recommending for improving pubescent girls school-going experiences as they transition through sexual maturation. FAWE/Kenya followed up with an intervention in schools and for

designing reusable sanitary pads; while Makerere University subsequently conducted follow-on research in Uganda, including an intervention that designed the low-cost Maka pads (made of papyrus leaves) for school girls. However less information is available in the literature on these projects. More recently, a series of working papers emerged from a small randomized control trial in Nepal that explored the use of menstrual cups (a silicone bell-shaped device that is vaginally inserted) in a sample of 198 girls from four schools in one region of Nepal (Oster & Thornton, 2010). The researchers reported that girls without cups were 2.6% less likely to attend school, but found “no significant effect of providing menstrual cups on girls’ attendance” (Oster & Thornton, 2009a, p.3). The implications for the generalizability of this study’s findings are less clear given the great variation in cultural beliefs about insertion of menstrual products, and the possibility that such devices might not be acceptable in other social and cultural contexts. However the innovative use of methods (e.g. diaries) provides a useful model for designing other studies on menstrual-hygiene management, as will be discussed later in this paper. The study also provided important insights into menstrual-related discomforts that girls were experiencing and that may be hindering attendance, such as menstrual cramps; and into the peer dynamics around technological product uptake among Nepali school girls (Oster & Thornton, 2009b).

The recently published report “New Lessons: The Power of Educating Adolescent Girls,” which includes a review of existing interventions and research on girls’ education to date, highlights the provision of toilets and sanitary towels as supply-side interventions that have been utilized in programs aiming to retain girls in school, but for which inadequate empirical evidence exists (Lloyd, 2009). The latter gap highlights the need for better quality evaluation of multi-level interventions, with attention to the synergistic nature of the menstrual-hygiene management components described earlier as essential for creating a girl friendly school environment. The

authors also describe a mixed method study conducted in Malawi (noted as forthcoming), which suggested that menstruation was not in fact disruptive to girls' attendance (Ibid., p.23).

However, from the brief description provided in the report, it is not possible to ascertain whether analyzing the attendance of 14-16 year olds (the age range of the study sample) may have missed accounting for the experiences of girls who had already dropped out due to challenges of girl unfriendly school environments. The Malawi study is expected to make an important contribution to the empirical literature, along with the not yet published data emerging from a pilot sanitary pad and puberty education intervention in Ghana conducted by interdisciplinary researchers from Oxford University.

The use of qualitative and participatory methods were utilized in an in-depth research project conducted in northern Tanzania (by the author) that explored how the onset of menses (and puberty overall) may be disruptive to girls' school participation and attendance (Sommer, 2009a; Sommer, 2009b). The study explored both the physical challenges of menstrual management that may arise for girls in school settings, and the social and cultural meanings of puberty (and menstrual onset) that may exist in local society and create pressures for girls as their bodies mature, that in turn interrupt school attendance and participation. The research methods included in-depth interviews with girls and adults who intersect in their daily lives, along with observation, archival analysis, and the use of participatory methods with girls in and out of school. The study concluded that school environments were hindering some menstruating girls' comfort levels, focus, and participation in the classroom, and highlighted the importance of incorporating girls' recommendations into interventions aimed at improving school environments for menstruating girls (Ibid.). The study also identified a significant gap in girls' pragmatic menstrual management information, with findings subsequently utilized to publish a

girl's puberty book in Tanzania for 10-14 year olds. The latter has received very high uptake, with the Ministry of Education asking to approve the book for use in the primary school curriculum, indicating local recognition of the gap in available guidance on pubertal onset and menstrual-hygiene management guidance for girls. Although the overall study provided useful Tanzania-specific data on girls' experiences of menstruation and schooling, additional in-depth study of different regions of the country, including those with significantly different cultural backgrounds, water availability, and social support for girls' education would enrich the empirical evidence for policy and intervention in Tanzania.

The gray literature also contains numerous useful reports and articles regarding the challenges of menstrual-hygiene management for girls, and the prioritization of government and donor resources to address school girls' pubertal-related needs. These include findings from smaller-scale (and more informal) research conducted by African's women's groups (NUEW & CRS, 2002; FAWE, 2008; GWE-PRA, 2001); and policy and programmatic guidance in reports such as those from UNICEF WASH in schools (UNICEF, 2009). Additional literature may be emerging in the coming years as a number of public-private collaborations to provide sanitary materials and facilities in schools are evaluated, including the Proctor and Gamble project with Save the Children in Ethiopia, the Johnson and Johnson collaboration with Duke University in Kenya, the Huru project in Kenya, and when the SHE project in Rwanda evaluates its efforts to produce and provide low-cost sanitary materials to school girls.

All of the above research approaches provide an important foundation for addressing remaining gaps in the empirical evidence on the challenges school girls may face upon reaching menarche and managing their menses in school, with additional evidence also needed (although not to be addressed in this paper) on the changing pubertal traditions and experiences that are

occurring across low-income countries as migration and globalizing influences shift family structures and practices. In terms of gathering quality data on the specific questions surrounding menstrual-hygiene management in schools, both the sensitive nature of the topic and the importance of capturing girls' voiced recommendations point to the usefulness of utilizing participatory methods. However in order to assure that governments and donors can more effectively plan the use of limited health and education-related resources, it is also important to use quantitative methodologies that are better able to capture the magnitude of the problem for girls, and the effectiveness of proposed interventions. These two methodological approaches will be discussed further below.

Research methods for collecting effective menstrual management-related evidence

In discussing the specific recommended methodologies for gathering menstrual-hygiene related data, it is important to emphasize the sensitivity of the topic of menstruation in many cultures and societies, and the need for particular care when exploring the experiences of menstruating girls and the perceptions of the adults in their lives (such as teachers, mothers, school administrators). As already mentioned, in many societies the onset of menstruation and its subsequent management are highly secretive, with the onset of menses potentially perceived as linked to sexuality (with menarche sometimes perceived by parents as an indication that girls have been engaged in sexual intercourse) (Sommer, 2009a; personal communication Brad Kerner, SCF), and/or any of the other taboos and beliefs mentioned above. Given the latter, researchers interested in identifying barriers for girls in managing menses successfully in school should consider utilizing research methods demonstrated to be most effective for eliciting valid information on sensitive topics. Above all, research should be conducted in confidential settings,

and girls (and any other research participants) should provide their informed consent for participation in any research gathering activities.

Use of participatory methods

The use of participatory methods for both empowering research participants and for eliciting sensitive and in-depth information about people's experiences (both literate and illiterate) directly supports the feminist approach of consciousness-raising as a goal of research with women (and as discussed in this paper, with girls). Participatory methods are increasingly being utilized in the field, with emphasis given to the importance of the process itself being viewed as the end, and not only as the means, to providing in-depth understanding about a topic. Another important aspect of participatory methods is what Israel et al (2000) refer to as "cultural humility"; a notion that emphasizes "co-learning, which requires relinquishing one's role as the 'expert' in order to recognize the role of community members as full partners in the learning process" (p.10). This further supports the feminist approach to research which rejects the traditional division between the researchers and the person being researched. A range of participatory methods currently exist, including social mapping, body mapping, storytelling, cartooning and drama.

In applying participatory methods to research on menstrual-hygiene management, researchers can explore meanings and myths around menstruation that girls and/or adults within the society hold, meanings that may be relevant for developing quantitative research tools for more large-scale research, or for devising appropriate programmatic interventions such as the provision of menstrual-hygiene education or the installation of culturally appropriate mechanisms for disposal of used sanitary materials. In the Tanzania study (mentioned above), the activities in which girls shared menstrual-related beliefs around disposal of used materials

identified important local taboos, such as a prohibition or acceptability of burning tissues and pads (depending on the cultural background), and the importance of providing private spaces for the drying of used menstrual cloths so that the owners of the cloths would not be cursed (if the cloths were seen by others) (Sommer, 2009b). As useful as participatory approaches are for the collection of data on more sensitive topics, of equal importance is the empowerment of the participating girls engaged in the research process.

Participatory methods were used in the Tanzania study to specifically explore girls' experiences of menstruation and schooling. The research methods included a range of participatory activities conducted with groups of in-school and out of school girls (aged 16-19), soliciting, for example, their (anonymously provided) puberty questions, their recommendations for how to improve the school environment for other menstruating girls, and their guidance about what a puberty curriculum for primary school girls should include (Ibid.). The purpose of using participatory methods in research on a topic such as the experience of menstruation for girls is to truly capture girls' voices, their understandings about their bodies, their maturation, how the latter interrelates with their menarche narratives, and all from the perspective of simultaneously wanting to empower the girls as they participate in the research process. Interviews alone would not necessarily elicit the diversity and range of information that can be gathered with a participatory approach. The Tanzania research also engaged girls in writing (anonymously) one-page "menstrual stories" that explained their own personal experience of menarche, including how they felt, who they told, what emotions they had experienced, how they learned to manage menstrual flow, and what advice they had for younger girls who have yet to reach menarche (Sommer, 2009a). The stories provide rich insights into the gaps in girls' knowledge, and the

challenges they may have faced in managing menses in school environments, all of which serve to better inform policy makers, NGOs, education and health researchers and practitioners.

Participatory methodologies can also be used with girls and adults (such as teachers, school administration, school nurses) to map out changes in the school environment, such as the location, design, and privacy of sanitary facilities and water availability. In the Tanzania study, girls were asked to draw the “perfect girl’s toilet”, a non-verbal mechanism for creative response that identified previously unknown gaps in the data, such as the desire of girls to have locks on the inside of latrine doors, water buckets or taps inside each latrine for private hand-washing or menstrual stain-removal, and incinerators located near to latrines so boys would not witness (and tease) girls when they emptied dustbins with used sanitary materials (Sommer, 2009b). The research was intentionally conducted with older adolescent girls, given the expectation that they would be more comfortable reflecting on the experience of puberty and providing insights.

As with all research methods, there are limits to what participatory methods can answer, and combining such methods with other qualitative and ethnographic research approaches, such as in-depth interviews and participant observation, and with quantitative methodologies, can strengthen research findings. The selection of methods depends on the research questions being posed, the analytic framework, and the available resources for the research study. While the use of participatory methods is particularly relevant for understanding girls’ voiced challenges and solutions to menstrual-hygiene management, the use of quantitative methods can complement the participatory data collection, or can be used independently to better understand the magnitude of the impact of menstrual management on girls’ school participation and attendance and/or the effectiveness of selected interventions.

Use of quantitative methods

The use of quantitative methods for testing models, theories or hypotheses, and for quantifying variation, predicting causal relationships, and describing characteristics of a population is essential for the capturing of empirical evidence that can be generalized to a larger population, and subsequently utilized by policy makers and programmers to prioritize available resources for developing and supporting appropriate interventions. Quantitative researchers approach a research question from an objective standpoint, using approaches that aim to minimize the bias within a study, and thereby reduce threats to the validity of the data being collected (Cresswell & Clark, 2007). The collection of quantitative data is primarily done through the use of closed-ended questions that are designed to minimize leading the respondent in a particular direction. In contrast to qualitative research methods, which seek to explore phenomena through the use of open-ended methods (such as semi-structured interviews, focus groups and participant observation), quantitative methods aim to confirm hypotheses about phenomena through the use of highly structured research methods such as surveys, questionnaires, and structured observation (FHI, accessed online April 2010).

The use of quantitative methods was demonstrated in the randomized control trial conducted in the Nepal menstrual cup study (mentioned above). The researchers aimed to estimate the causal impact of providing sanitary materials (menstrual cups) on girls' schooling and particularly attendance in Nepal (Oster & Thornton, 2009a). Although menstrual cups are not a widely used sanitary material in industrialized countries as compared to pads, the researchers determined that pads were likely to be unaffordable for girls over the long term, and that for the research design purposes, the menstrual cups would be unlikely to be shared across treatment and control groups, and therefore less likely to contaminate the data than the provision

of pads. The researchers collected baseline and follow-up surveys, along with monthly time diaries maintained by the girls. The baseline and final surveys included questions about school attendance and performance, as well as self-esteem, empowerment and health. Three measures of attendance were collected: the official school attendance, the girls' diaries in which they noted days missed; and random checks the researchers conducted in the schools. Although this study is specific to this region of Nepal it makes an important contribution to the quantitative empirical literature, and provides a good example of the application of survey methodologies, triangulated with time diary data, for the study of menstruation and education. The research methods also revealed additional useful findings, such as a change in the time spent by girls during menses washing out rags (which appeared to diminish with use of the menstrual cups), and the consistency of cultural taboos around girls participation in cooking and religious activities when girls were menstruating, regardless of being in the treatment and control group (Ibid.). The application of a quantitative approach in this scenario derives from the researchers' interest in determining if a causal impact existed from the intervention, and in quantifying the impact.

As already noted, the use of quantitative methods answers a different set of research questions than the application of participatory methodologies. Challenges exist with quantitative methods in terms of accurately capturing the impact of menses on girls' school participation and attendance when girls miss partial days of school due to menstrual discomfort (but may be marked "present" during morning roll call and recorded as attending in school records); when girls describe their absenteeism as illness rather than menses; and/or when cultural pressures related to menstrual onset influence girl's school-going. In applying quantitative methods to the topic of menstrual-hygiene management, researchers could effectively conduct evaluations of multi-level interventions that seek to change the girl unfriendly school environment (such as

national policy on the provision of adequate latrines, the availability and location of water, the inclusion of puberty/menstrual management education, the installation of disposal mechanisms, and the sensitization of teachers), and capture the impact on girls' participation and attendance. At a minimum, a pre- and post-assessment questionnaire should be used for outcome evaluation, with process evaluation conducted during the course of the intervention to assure the feasibility and validity of intervention implementation (Bartholomew, Parcel, Kok, Gottlieb, 2006). If intervention (experiment) and control schools are appropriately matched, a large-scale intervention trial could determine if such multi-level interventions had a measureable impact on girls' school-going, and were therefore worth investing in for scaling up across a country's education system.

As with the participatory methods, there are limits to what quantitative methods can answer, including the inability to gain a deeper understanding of social and cultural implications of menstrual onset and puberty that may be impacting on girls' school-going and ability to complete their education. In addition, quantitative methods are unable to capture the voiced recommendations of girls about the challenges they experience from menstrual-hygiene management in schools, and hence the importance as already noted of using participatory and other qualitative methodologies.

Translating menstrual-hygiene research into policy and programming

The importance of collecting quality empirical evidence is essential for moving ahead the menstrual-hygiene management and education agenda. The utilization of participatory methodologies for eliciting from girls the specific challenges they face in managing menses in school, along with the social and cultural pressures that may arise at the time of menstrual onset, is critical for devising appropriate interventions to retain pubescent girls in school if the onset of

menses is determined to directly (or indirectly) impact on girls' school attendance or concentration and participation in the classroom. Engaging girls in the research process is critical, an approach underscored by the call to action from the Society of Adolescent Medicine (SAM) that has advocated for researchers to more significantly include adolescents in research studies (SAM, 2003), with the expectation that through adolescents' increased participation, researchers will produce higher quality and more valid forms of data on young people's actual experiences and recommendations. More effective incorporation of adolescents into the research process is equally important for quantitative methodologies, with researchers expected to design questionnaires that more adequately capture the real concerns and behaviors of adolescents. Quantitative approaches are also needed to more effectively assess the impact of multi-level interventions for menstruating girls, measuring the potentially synergistic effect of combined girl-friendly interventions through well designed process and outcome evaluations.

Additional critical gaps in the existing evidence that are of relevance to the menstrual-hygiene management research agenda include the following: one, the challenges faced by female teachers in schools across low-income countries, with anecdotal information indicating that teachers often having to leave school for periods of time in the middle of the day to address their menstrual-hygiene needs; two, the unique situation of girls living in post-conflict (and post-disaster) settings, who are faced with managing menses in crowded environments that lack sufficient sanitary facilities and materials, and who must manage menses in classroom settings that are awkward without adequate sanitary materials, such as sitting on the ground for long periods of time (and standing and sitting repeatedly to answer teachers' questions); and three, research on menstrual-hygiene management that is disaggregated by rural and urban contexts, by economic status, and by ethnic background, so a more nuanced understanding can be gathered of

the implications (or lack thereof) of menstrual onset for girls' school-going, participation and comfort levels.

Ultimately the aim of future research on the issue of menstrual-hygiene management should be concerned with assuring schools are non-discriminatory environments, allowing both girls and boys to succeed to their utmost levels. Until national education systems adequately address the challenges of adolescent girls, and assure that girls are able to attend school in as comfortable an academic environment as boys, schools will remain gender discriminatory, and the gender gap will likely remain.

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