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Girls' Menstrual Management in Five Districts of Nepal: Implications for Policy and Practice

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ABSTRACT *Discriminatory practices related to menstruation affect the social, mental and physical wellbeing of girls in many low- and middle-income countries. We conducted mixed methods research in five districts of Nepal to explore how menstruation affected girls' ability to fully participate in school and community life. We conducted 860 structured interviews, 26 group interviews and 10 focus group discussions with schoolgirls in rural areas, 14 semi-structured interviews with girls'*

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mothers, and 10 interviews with health teachers. Girls in all districts experienced social, material and information barriers to confident menstrual management. Menstrual blood was believed to carry diseases, and girls' movement was restricted to contain ritual pollution and protect them from illness, spirit possession, and sexual experiences. Taboos prevented girls from worshipping in temples or in their home, and some girls were not allowed to enter the kitchen, or sleep in their home while menstruating. Teachers and parents felt unprepared to answer questions about menstruation and focused on the maintenance of restrictions. Teachers and students were embarrassed discussing menstruation in school and classes were not question-driven or skills-based. Gender disaggregated teaching of menstruation and engagement of health facility staff may have positive effects. Community participatory approaches that engage girls, their families and the wider community are necessary to address harmful cultural practices. Cross-sectoral approaches to provide clean, private, safe spaces for girls and increased availability of preferred materials could enable confident menstrual management.

KEYWORDS public policy; gender; culture

Introduction

Adolescence presents a critical window to break cycles of poverty, transform gender roles and improve health outcomes (UN General Assembly, 2015). Yet for many girls in low- and middle-income countries (LMICs), menarche results in practices which are gender discriminatory and stigmatising (Crawford, Menger, & Kaufman, 2014). The linkages between menstruation and girls' participation in school and society were highlighted by Jackie Kirk (Kirk & Sommer, 2006). Jackie was committed to ensuring that policies and programmes were informed by girls' experience. Listening to girls as expert "knowers" of their own lives was an important focus of Jackie's work (Kirk & Garrow, 2003). This paper is inspired by her legacy of working across academic and practitioner worlds to improve girls' lives, and is the result of an inter-agency collaboration between UNICEF, WaterAid and HERD International. We present the findings of research conducted in five diverse districts of Nepal to describe how girls managed their menstruation and explore how menstruation affected their ability to participate in school and community life.

Effects of Menstruation on Girls in Low- and Middle-Income Countries

Material and psychosocial deprivations experienced by menstruating girls in LMICs limit confident menstruation management (Crichton, Okal, Kabiru, & Msiyaphazi Zulu, 2013). Inadequate access to water, sanitation and hygiene (WASH) facilities in homes and in schools affects girls' experience of and access to education (Alam et al., 2017; Kirk & Sommer, 2006; Mahon & Fernandes, 2010; Mason et al., 2013; Sumpter & Torondel, 2013; WaterAid,

2009). Challenges in accessing materials which can be easily washed, dried and disposed of, often mean that girls' confidence and ability to participate in community and school activities is curtailed (Hennegan, Dolan, Wu, Scott, & Montgomery, 2016; Hennegan & Montgomery, 2016). Access to comfortable menstrual materials is particularly challenging for girls in rural areas.

Psychosocial deprivations are caused by cultural taboos around menstrual blood, which is often considered to be polluting and dirty. A recent literature review found that girls in diverse contexts were subject to restrictions in their daily lives while menstruating because of these taboos (Chandra-Mouli & Patel, 2017). Girls were commonly prevented from cooking, participating in religious activities and moving freely outside the home (Sumpter & Torondel, 2013). A lack of accurate and pragmatic information can lead girls to feel ashamed, anxious, confused and fearful about menstruation (Crichton et al., 2013; McMahon et al., 2011; Sommer, 2010).

Menstrual Management in Nepal

Nepal is an ethnically diverse, mainly Hindu, patriarchal society (Central Bureau of Statistics, 2012). Menstruation is commonly believed to be polluting and should be contained through ritual and restriction (Bennett, 1983; Crawford et al., 2014). In Nepalese Hindu culture, menarche is associated with female sexual maturation. Traditionally, if a girl is married when she starts menstruating, her sexual maturation is unproblematic because she belongs to her husband's family who will ensure that her sexuality is properly channelled in the procreation of the patrilineal line. However, if a girl starts menstruating before marriage, her "unattached sexuality" can endanger herself and her family. Her purity and the reputation of her family are vulnerable from menarche onwards (Bennett, 1978; Cameron, 1998). Menarche is therefore often marked by a period of seclusion from the family. In some families in the west and far-west of Nepal, a form of this seclusion is practiced every time a woman menstruates through the practice of *chhaupadi* (L. Joshi, 2015; Ranabhat et al., 2015). While practicing *chhaupadi*, women must sleep in a hut (*chhau goth*) away from the family home in order to prevent ritual pollution.

In 2015, 71% of women aged 15-49 in mid-western Nepal reported practicing *chhaupadi* (G. o. N. Central Bureau of Statistics, 2015). *Chhaupadi* was declared illegal in 2005, and enforcing *chhaupadi* is punishable by a fine or prison sentence. Multi-sectoral commitment to eradicate *chhaupadi* and enable confident menstrual management is evident in Ministry of Health, Ministry of Water Supply and Sanitation and Education Sector policies and plans (Karki et al., 2017).

There are few peer-reviewed publications which explore the experience of menstruation from the perspective of schoolgirls in Nepal, and non-governmental organisation (NGO) reports usually describe practices from a

specific area among a small population (Karki et al., 2017). By combining the results of two mixed methods studies, we seek to capitalise on political interest in menstrual management and provide evidence from diverse contexts to inform policy and practice in Nepal. This paper seeks to inform decentralised planning in Nepal's new federal structure through presentation of district specific findings, and inform policy direction at a national level by examining commonalities across districts. Both studies used similar methods to describe practice and explore experience. Data collection for WaterAid occurred from February 2016, and for UNICEF from April 2016. We consider the multiple dimensions of "menstrual poverty" (Crichton et al., 2013) using a framework which describes knowledge, material and social environmental factors as affecting confident menstrual management (van Eijk et al., 2016).

Methods

Study Design

We used a parallel mixed method design to answer different research questions about the same phenomenon. Quantitative cross-sectional surveys with girls were used to describe menstruation management practices, and qualitative group interviews (GIs), focus group discussions (FGDs) and semi-structured interviews (SSIs) were used to explore how menstruation affected girls' ability to participate in everyday life. Districts and schools were selected according to the interests of commissioning agencies. UNICEF specified that we should collect data in rural areas of Achham, Bajura and Parsa districts where some schools had received the WASH in Schools (WinS) programme. We collected data in two schools that had received the WinS programme and two schools that had not received the programme in each district (n = 12 schools). WaterAid was preparing to implement a WASH programme in Sindhuli and Udaypur districts, and needed to understand differences between urban and rural areas. Therefore, we collected data in six rural schools, one urban school, and one peri-urban school per district (n = 16 schools).

Since many girls drop out of school during the transition from primary to secondary education and classroom sizes were small (UNICEF, UNESCO, & Government of Nepal, 2016), we sampled girls in grades seven to 10 in large schools. We collected qualitative and quantitative data in 10 schools, and quantitative data only in the remaining 18 schools. Girls from four urban/peri-urban schools and 24 rural schools participated in the study. Our sampling strategy, consent process and methods of data collection were the same in all five districts.

Setting

Bajura and Achham districts are hilly and among the least developed districts in Nepal (Central Bureau of Statistics, 2014) (Government of Nepal & United Nations Development Programme, 2014). *Chhaupadi* is practiced in these districts. *Chhaupadi* is not commonly practiced in Parsa in the plains, nor in hilly Sindhuli and Udaypur. Udaypur has a higher development ranking and higher female literacy of 62%, compared with Achham, Bajura and Parsa with female literacy rates of 37%, 43%, and 44% respectively (Table 1).

District	Terrain	Area (km ²)	Region	Population	Devpt. ranking out of 75 districts	Human Devpt. Index	Female literacy
Udaypur	Hill	2,063	East	317,600	37	0.475	61.9%
Sindhuli	Hill	2491	Central	296,192.8	52	0.440	52.6%
Parsa	Plains	1,353	Central	601,017	42	0.464	44%
Achham	Hill	1,680	Far West	257,477	71	0.378	37%
Bajura	Hill	2,188	Far West	134,912	75	0.364	43%

Table 1. Study district characteristics (Sources: Central Bureau of Statistics, 2014; Government of Nepal & United Nations Development Programme, 2014)

Sampling

Qualitative sampling: Students and teachers from classes seven to 10 were briefed about the study and received written information and parental consent forms. We asked teachers to identify girls who might be willing to participate, and girls from low socioeconomic status households who did not attend school regularly, because we hypothesised that they may experience challenges in menstrual management. We checked that these girls had menstruated and had parental consent, and invited them to participate in a group interview or focus group discussion.

Quantitative sampling: In order to describe and estimate the prevalence of many practices in study districts, and enable comparison between one district and another we sampled 860 girls in total: 200 girls per district from Achham, Bajura and Parsa; and 130 girls per district from Udaypur and Sindhuli. We excluded girls who had participated in qualitative discussions, those without parental consent, and those who had not started menstruating. We randomly sampled eligible girls by drawing names from a basket, and invited them to be interviewed. We calculated the required sample size on the basis of a prevalence of girls who had received information about menstruation before menarche. A previous study showed that most girls have

not received information about menstruation before menarche (WaterAid, 2009), and our sample size was sufficient to detect such rare outcomes.

Qualitative and Quantitative Data Collection

Data were collected by district teams of four trained and experienced female researchers (Table 2). Topic guides and questionnaires were developed in English, translated into Nepali, and back-translated for quality control. Researchers also spoke Bhojpuri and Doteli and conducted discussions in local languages when necessary. Tools were piloted in rural schools in Kavrepalanchok and Parsa districts that were not sampled for the main study, and adapted. Informed written parental consent and participant consent were taken. Ethical approval was obtained from the Nepal Health Research Council.

Respondents (n)	Method (n data collected)	Number of Respondents				
		Accham	Bajura	Parsa	Udaypur	Sindhuli
Quantitative data collection						
	Structured interviews	200	200	200	130	130
Qualitative data collection						
Mothers	SSIs* (14)	2	2	2	4	4
Girls	GIs*(28)	8	8	8	16	16
Girls	FGDs* (10)	12	12	13	13	12
Teachers	SSIs* (10)	2	2	2	2	2

*SSI = semi-structured interview; GI = group interview; FGD = focus group discussion

Table 2. Data collection

Group Interviews: To make girls feel as comfortable as possible we asked them to choose between an individual semi-structured interview, or an interview with a friend. All preferred to be interviewed with a friend. Group interviews are similar to semi-structured interviews because they allow for an intimate and in-depth exploration of experiences. We explored girls' personal experience with menstrual management in school and at home with four pairs of girls per school in Sindhuli and Udaypur, and two pairs of girls per school in Achham, Bajura and Parsa.

Focus Group Discussions: We used focus group discussions to discuss community and school norms about menstrual management. Focus group discussions allow participants to interact with each other, building-on or challenging others' ideas. We used a game, storytelling and body mapping to enhance communication and participation. We conducted one focus group discussion per school with six to eight menstruating girls to explore how

knowledge, the social environment and the material environment affected their experience of menarche and menstrual management.

Semi-structured interviews: To triangulate information from girls, and collect data on school and community barriers to confident menstrual management, we conducted semi-structured interviews with 14 mothers of participants from the mixed methods schools, and 10 teachers who taught the “Environment, Health and Population” subject for class six to nine per school. This subject covers adolescent health, sexual and reproductive health and menstruation. Three teachers were female and seven were male. We discussed similar topics with mothers and teachers as we did with girls, additionally asking teachers about how menstrual management was taught and about how the school was supporting confident menstrual management.

Cross-sectional surveys: Questionnaires were administered by researchers. We collected socio-demographic data, and data describing menstrual management at school and at home. We asked about materials used, cleaning and disposal of materials, experience of restrictions and sources of information.

Data Management and Analysis

Quantitative data management and analysis: Quantitative data were collected on Samsung tablets using Open Data Kit software, and uploaded to a central server throughout data collection. Data were analysed using SPSS v20. We generated a wealth index using household assets (Table 3). For each household characteristic, participants received a score of one, and then scores were summed. If a household scored four or lower they were categorised as having low socioeconomic status, if they scored from five to seven they were of medium socioeconomic status, and scores of eight and above were classified as having high socioeconomic status (Ministry of Health & Population, 2011).

Qualitative data management and analysis: All qualitative data were transcribed in Nepali by researchers. Transcripts were then translated from Nepali to English and checked. Descriptive content analysis was conducted using Nvivo V11 (Green & Thorogood, 2005). Authors Joanna Morrison, Machhindra Basnet and Anju Bhatt read the data, making memos, and made an initial coding structure based on emergent themes. This coding structure was applied to a sample of data from each respondent type. We discussed patterns in the data, compared responses from respondent types and districts, revised the coding structure and coded the data.

Household assets	Roof construction	House construction	Toilet facility	Water supply
<ul style="list-style-type: none"> • Electricity • Solar • Radio • Television • Mobile phone • Computer • Livestock • Bank account 	<ul style="list-style-type: none"> • Calamine/cement fibre • Cement dhalan 	<ul style="list-style-type: none"> • Brick and cement • Stone and cement • Cement block 	<ul style="list-style-type: none"> • Flush to septic tank • Flush to somewhere else • Pit latrine with slab 	<ul style="list-style-type: none"> • Piped water in compound

Table 3. Variables used in the wealth index calculation

Results

Of the 860 girls surveyed, 92% (794) were Hindu. Achham and Bajura had more Hindu advantaged Brahmin/Chettri girls (64% (128) and 78% (126) respectively), and more girls from disadvantaged Hindu hill Dalit ethnic groups (24% (48) and 18% (35) respectively). In Udaypur and Sindhuli there were more girls from Buddhist disadvantaged hill Janajati groups than other districts (34% (44) and 52% (68) respectively), and in Parsa 70% (140) of girls were of marginalised Hindu Madhesi ethnicity. Seventy-six percent (657) of the girls' mothers were not educated, and 67% (573) lived in mid-range socioeconomic status households (Table 4). Girls' mean age was 15 years old, and ranged from 11 to 19 years old. We present our findings in terms of how knowledge, material and social environmental factors affected menstrual management (van Eijk et al., 2016). Quotations are referenced by district, respondent type and identification number.

Knowledge and Information

Knowledge and information at menarche: The mean age of menarche was 13 years old. Seventy-six percent (653) of girls did not know anything about menstruation before menarche. Most girls were scared, embarrassed and upset: "I was panicked and I felt strange. I thought that I might die because of the heavy blood flow. I felt that there might not be enough blood in my body" (Sindhuli FGD 402). Those who knew about menstruation received information from mothers (56%, 117), older sisters (54%, 112) and friends (39%, 81). Information was usually about restrictions, or cramps. Girls' mothers told them to "sit carefully" so that blood would not stain where they

	Total N=860 (%)	Achham N=200 (%)	Bajura N=200 (%)	Parsa N=200 (%)	Udaypur N=130 (%)	Sindhuli N=130 (%)
Caste/Ethnicity						
Brahmin/Chettri	384 (44.7)	128 (64)	156 (78)	9 (4.5)	51 (39.2)	40 (30.8)
Madhesi	140 (16.3)	0 (0)	0 (0)	140 (70)	0 (0)	0 (0)
Hill Janajati	121 (14.1)	3 (1.5)	3 (1.5)	3 (1.5)	44 (33.8)	68 (52.3)
Hill Dalit	84 (9.8)	48 (24)	35 (17.5)	1 (.5)	0 (0)	0 (0)
Sanyasi/Sahi Thakuri	55 (6.4)	21 (10.5)	6 (3)	0 (0)	12 (9.2)	16 (12.3)
Terai Janajati	54 (6.3)	0 (0)	0 (0)	25 (12.5)	23 (17.7)	6 (4.6)
Muslim	11 (1.3)	0 (0)	0 (0)	11 (5.5)	0 (0)	0 (0)
Terai Dalit	11 (1.3)	0 (0)	0 (0)	11 (5.5)	0 (0)	0 (0)
Religion						
Hindu	794 (92.3)	200 (100)	199 (99.5)	187 (93.5)	124 (95.4)	84 (64.6)
Buddhist	41 (4.8)	0 (0)	0 (0)	0 (0)	1 (0.8)	40 (30.8)
Other (Christian, Muslim)	25 (2.9)	0 (0)	1 (.5)	13 (6.5)	5 (3.8)	6 (4.6)
Educational level of mother						
None	657 (76.4)	166 (83)	173 (86.5)	128 (64)	92 (70.8)	98 (75.4)
Below class 10 (higher secondary)	177 (20.6)	30 (15)	25 (12.5)	64 (32)	33 (25.4)	25 (19.2)
Class 10 and above	20 (2.3)	1 (0.5)	2 (1)	7 (3.5)	5 (3.8)	5 (3.8)
University	2 (0.2)	0 (0)	0 (0)	0 (0)	0 (0)	2 (1.5)
Don't know	4 (0.5)	3 (1.5)	0 (0)	1 (0.5)	0 (0)	0 (0)
Wealth Index						
Low	190 (22.1)	42 (21)	53 (26.5)	48 (24)	14 (10.8)	33 (25.4)
Medium	573 (66.6)	148 (74)	134 (67)	103 (51.5)	99 (76.2)	89 (68.5)
High	97 (11.3)	10 (5)	13 (6.5)	49 (24.5)	17 (13.1)	8 (6.2)

Table 4. Study participant characteristics

sat. Some girls received advice from elder sisters about how to fold menstrual cloth, and the importance of using clean cloth. Few girls were given information about disposal of menstrual materials.

Girls and mothers gave vague descriptions of menstruation, and explained it as the body disposing of “impure” blood. Most mothers felt embarrassed and unprepared to talk to their children about menstruation: “What can be discussed with my son? I have not even talked about (menstruation) with my daughter, how can I talk with my son?” (Udaypur SSI Mother 313).

Knowledge and information after menarche: After menarche, girls received information from mothers, friends and teachers (Table 5). Seventy percent (80) of girls in Achham and 83% (125) of girls in Bajura received information from teachers. Survey data from Bajura, Achham and Parsa showed that 88% (529) of girls had received a class about menstruation. Girls told us that menstruation was often taught with prevention of sexually transmitted diseases: “Sir told us that women should not walk around alone during menstruation and should not live with anyone. If anything happens then it causes HIV.” (Sindhuli FGD 401). Linkages between menstruation and infection were taught in schools: “[The teacher] taught us that we should regularly bathe, otherwise there would be germs and we would get infected” (Achham GI 306). Teachers also related menstrual hygiene with cervical cancer: “We teach our students that they should keep themselves clean during menstruation to remain healthy, if not they might face many health problems in the future such as uterine problems and cancer” (Sindhuli SSI Teacher 9). Mothers also related menstruation with weakness and vulnerability to disease: “I feel like menstruation is the starting point of disease for every woman. Various deadly diseases are all caused because of menstruation” (Udaypur SSI Mother 1). Resting and eating “nutritious” food, such as fruit, was believed to restore the body: “In class nine we knew that impure blood comes out, then our body will be weak so we must eat more fruit” (Udaypur GI 309).

When menstruation was taught about in the classroom, teachers focused on menstrual physiology and girls were dissatisfied with the class. Teachers often got embarrassed, referred students to their textbook, and did not answer questions: “If girls try to get beyond a theoretical explanation I suggest them to get married and then they will get all the information” (Sindhuli SSI Teacher 415). Teachers said that materials and training were inadequate, and they found it difficult to manage mixed gender classes. There were not enough classrooms and teachers to disaggregate classes by gender. Although 29% (154) of girls were invited to ask questions in this class, most did not: “We didn’t ask, we only thought about things. We couldn’t say anything” (Bajura GI 205). Instead, they asked their friends: “Why is there so much bleeding? Why does our stomach hurt so much? Do they have the same problems?” (Bajura GI 203). Girls said that they were more comfortable discussing menstruation with female teachers, but if a class was well taught

the gender of the teacher was not important. Girls, mothers and teachers were positive about NGO personnel teaching menstrual management. One teacher said:

When I was new to this profession I did not recognise any students so it felt easy to teach them about (sexual and reproductive health). But as I have built-up a relation with students and their guardians, it becomes difficult to teach them. (Udaypur SSI Teacher 316)

	Total N=860 (%)	Achham N=200 (%)	Bajura N=200 (%)	Parsa N=200 (%)	Udaypur N=130 (%)	Sindhuli N=130 (%)
Have learned information since menarche	590 (68.6)	114 (57.0)	151 (75.5)	167 (83.5)	48 (36.9)	110 (84.6)
Source of information	(n=590)	(n=114)	(n=151)	(n=167)	(n=48)	(n=110)
Mother	340 (57.6)	57 (50.0)	63 (41.7)	129 (77.2)	15 (31.3)	76 (69.1)
Older Sister	250 (42.4)	42 (36.8)	67 (44.4)	65 (38.9)	18 (37.5)	58 (52.7)
Friend	352 (59.7)	66 (57.9)	114 (75.5)	78 (46.7)	25 (52.1)	69 (62.7)
Teacher	364 (61.7)	80 (70.2)	125 (82.8)	99 (59.3)	15 (31.3)	45 (40.9)
Book/magazine/ health magazine	213 (36.1)	27 (23.7)	120 (79.5)	12 (7.2)	20 (41.7)	34 (30.9)
Female relatives (cousin/sister in law)	132 (22.4)	25 (21.9)	37 (24.5)	37 (22.2)	8 (16.7)	25 (22.7)
Child club/young champion/ adolescents group	83 (14.1)	4 (3.5)	21 (13.9)	4 (2.4)	13 (27.1)	41 (37.3)
Radio	51 (8.6)	9 (7.9)	30 (19.9)	1 (0.6)	1 (2.1)	10 (9.1)
Others (TV, internet/health worker)	47 (8.0)	15 (13.2)	12 (7.9)	8 (4.8)	8 (16.7)	4 (3.6)

Table 5. Knowledge about menstruation after menarche

Material environment

	Total N=860 (%)	Achham N=200 (%)	Bajura N=200 (%)	Parsa N=200 (%)	Udaypur N=130 (%)	Sindhuli N=130 (%)
Material usually used for menstruation						
Cloth (reusable)	690 (80.2)	188 (94)	110 (55)	174 (87)	115 (88.5)	103 (79.2)
Sanitary pads (reusable)	69 (8)	6 (3)	55 (27.5)	7 (3.5)	0 (0)	1 (0.8)
Sanitary pads (disposable)	67 (7.8)	2 (1)	6 (3)	19 (9.5)	14 (10.8)	26 (20)
Wears several pairs of underwear	24 (2.8)	4 (2)	20 (10)	0 (0)	0 (0)	0 (0)
Nothing	10 (1.2)	0 (0)	9 (4.5)	0 (0)	1 (0.8)	0 (0)
Preferred material for managing menstruation						
Cloth (reusable)	388 (45.1)	123 (61.5)	62 (31)	112 (56)	46 (35.4)	45 (34.6)
Sanitary pads (disposable)	379 (44.1)	66 (33)	76 (38)	70 (35)	83 (63.8)	84 (64.6)
Sanitary pads (reusable)	89 (10.3)	10 (5)	60 (30)	18 (9)	0 (0)	1 (0.8)
Don't know/Nothing	129 (15)	28 (14)	65 (32.5)	21 (10.5)	13 (10)	2 (1.5)
Have ever used sanitary pads	331 (38.5)	35 (17.5)	31 (15.5)	83 (41.5)	82 (63.1)	100 (76.9)
How often do you use disposable sanitary pads?	n=331	n=35	n=31	n=83	n=82	n=100
Usually	80 (24.2)	2 (5.7)	10 (32.3)	21 (25.3)	15 (18.3)	32 (32)
Sometimes	160 (48.3)	18 (51.4)	6 (19.4)	33 (39.8)	43 (52.4)	60 (60)
Rarely	91 (27.5)	15 (42.9)	15 (48.4)	29 (34.9)	24 (29.3)	8 (8)
How did you obtain them?						
Self-bought	147 (44.4)	9 (25.7)	11 (35.5)	11 (13.3)	46 (56.1)	70 (70)
From relative	184 (55.6)	26 (74.3)	20 (64.5)	72 (86.7)	36 (43.9)	30 (30)

Table 6. Menstrual materials

Eighty percent (690) of girls used reusable, used cloth to absorb menstrual blood and 99% (685) of these girls always used dry cloth (Table 6). In Bajura,

menstrual management habits were slightly different than in other districts. Fifteen percent (29) of girls wore several pairs of underwear during menstruation and 28% (55) of girls used reusable sanitary pads. Girls in Bajura preferred reusable pads: "Blood will not leak and stain our clothes and we can go wherever we like. No-one will know we are menstruating" (Bajura FGD 201). Although many girls in all districts had been taught how to make reusable sanitary pads, only girls in Bajura were enthusiastic about using them. Girls in other districts found them time-consuming to make, complained that they didn't dry properly, found them uncomfortable and did not feel confident when wearing them. Girls in Udaypur and Sindhuli preferred disposable pads: "While using disposable pads there is no stress. There is total freedom. All the blood is absorbed there. Cloth moves and you feel tense about whether your clothes will get stained or not" (Udaypur GI 309). Although 61% (529) of girls had never used disposable pads, 44% (379) said they would prefer to use them. Seventy percent (70) of girls in Sindhuli and 56% (46) of girls in Udaypur bought pads, whereas girls in other districts tended to receive them from relatives.

Girls often preferred disposable pads when they travelled because they could dispose of them after use, and they were less likely to leak. Mothers tended to stay at home while menstruating, which made it easier to wash, dry and dispose of menstrual cloth. It was important to wash and dry reusable cloth soon after it was soiled to prevent staining, to prevent other people seeing menstrual blood and to prevent catching diseases when reusing the cloth. Cloth was always washed before disposal.

Seventy-two percent (499) of girls concealed drying menstrual cloth (data not shown in table) to prevent bringing shame on their family, to prevent being cursed by the person who saw the cloth and to prevent polluting the area. One mother told us: "I dry my cloth by covering it up, hiding it. People will say different things...I am afraid what society will say" (Sindhuli SSI Mother 412). Mothers, teachers and girls believed there were harmful bacteria in menstrual blood, and girls in Udaypur and Sindhuli worried that bacteria would be transferred to their hands while washing menstrual cloth.

Materials and health: Girls received conflicting information from mothers, teachers and friends about how different materials affected their health. Cloth and pads were reported to cause itching, rashes, or chaffing. Girls were worried about decayed cloth entering the body, and the "chemicals" in disposable pads: "[The teacher] taught us that hazardous chemicals are mixed in disposable pads" (Parsa GI 105). In Udaypur, girls said that disposable pads help to keep girls healthy by killing menstrual bacteria. Both pads and cloth were blamed for causing cancer and infections.

The disposal of menstrual materials was linked to beliefs about menstrual pollution and menstrual blood as carrying diseases (Table 7). Only three schools had waste disposal facilities, and none had private washing and drying facilities. Girls took used cloth home, and either burned, buried, threw

in a stream or threw materials in secluded places where no-one could see their materials or be infected by them: “The germs in the used pad can affect people...if the used pad is thrown anywhere then the flies can transmit diseases” (Achham FGD 301). In Bajura, girls said: “The air will be polluted if cloths are burned and then the polluted air will mix with water, and there will be high risk of spreading diseases” (Bajura FGD 201). In Parsa, girls and mothers were additionally worried about public shame and spirit possession if used materials were seen.

	Total N=860 (%)	Achham N=200 (%)	Bajura N=200 (%)	Parsa N=200 (%)	Udaypur N=130 (%)	Sindhuli N=130 (%)
Disposal method						
Burn	72 (8.4)	9 (4.5)	46 (23)	2 (1)	13 (10)	2 (1.5)
Throw away far from home	81 (9.4)	20 (10)	16 (8)	9 (4.5)	5 (3.8)	31 (23.8)
Bury in rubbish pit	118 (13.7)	36 (18)	20 (10)	11 (5.5)	30 (23.1)	21 (16.2)
Bury on land away from home	245 (28.5)	14 (7)	30 (15)	137 (68.5)	19 (14.6)	45 (34.6)
Throw in a stream	238 (27.7)	108 (54)	59 (29.5)	19 (9.5)	23 (17.7)	29 (22.3)
Always re-use cloth	72 (8.4)	7 (3.5)	27 (13.5)	5 (2.5)	32 (24.6)	1 (0.8)
Other	34 (4)	6 (3)	2 (1)	17 (8.5)	8 (6.2)	1 (0.8)

Table 7. Disposal of used materials

Social Environment

Containing sexuality and menstrual pollution: Girls, teachers and mothers discussed how menarche signified a new phase in girls’ lives, when they become a *taruni* (pubescent girl). Girls told us: “We cannot live like we did before” (Sindhuli FGD 402). Hindu girls were usually secluded inside a room for one week at menarche, staying away from the sun, friends and family, and not attending school. One teacher in Parsa said:

It felt like something drastic had happened... after menarche, parents say ‘now that she has started menstruating, she could get pregnant’. She should not go anywhere where she can be influenced by others because if anything happens, her family will lose their social standing. (SSI Teacher 109)

Seclusion at menarche was strict in Achham and Bajura:

My family did not let me touch my brother or anyone else or even the cattle. They did not let me go outside. I had to stay alone for 12 days. On the fourth day of menstruation they gave me nutritious food to eat ... (and) they only let me enter the house after 12 days of menstruation. (Achham GI 303)

It was believed that menstruating girls could curse their household with a look. Girls said: "We are kept in another person's house and we should not look at our father or the roof of our house" (Udaypur GI 002).

Seclusion at menarche was less strictly followed in Udaypur and Sindhuli. After menarche, there were fewer menstrual restrictions on girls in Sindhuli, Udaypur, and Parsa than other districts, perhaps because there were more Buddhist and Madhesi households in these districts. Irrespective of religion and ethnicity, almost all girls were restricted from worshipping gods in the temple or at home while menstruating (Table 8). Containing menstrual pollution avoided angering the gods and being possessed by spirits, which lead to misfortunes or illness in the family: "If you go into the kitchen to eat some food, then you will be possessed by the gods that are worshipped in our house" (Bajura GI 204). Girls in all districts told us about their fears of infertility, failing their exams, illness, and illness of family members if they worshipped at home or in a temple.

	Total N=860 (%)	Achham N=200 (%)	Bajura N=200 (%)	Parsa N=200 (%)	Udaypur N=130 (%)	Sindhuli N=130 (%)
Cannot visit religious place	846 (98.4)	200 (100)	198 (99)	194 (97)	127 (97.7)	127 (97.7)
Cannot attend religious occasion	678 (78.8)	191 (95.5)	172 (86)	121 (60.5)	96 (73.8)	98 (75.4)
Cannot worship in the household	844 (98.1)	199 (99.5)	198 (99)	195 (97.5)	126 (96.9)	126 (96.9)
Cannot touch male family members	390 (45.3)	119 (59.5)	123 (61.5)	32 (16)	68 (52.3)	48 (36.9)
Cannot cook food or enter inside kitchen	562 (65.3)	191 (95.5)	195 (97.5)	55 (27.5)	72 (55.4)	49 (37.7)
Cannot go outside as much as normal	149 (17.3)	58 (29)	46 (23)	12 (6)	17 (13.1)	16 (12.3)
Cannot eat any foods or drinks of their choice	512 (59.5)	159 (79.5)	179 (89.5)	94 (47)	38 (29.2)	42 (32.3)
Cannot sleep in the same household as others	159 (18.5)	120 (60)	34 (17)	1 (0.5)	3 (2.3)	1 (0.8)
Cannot sleep in the same bed as others	338 (39.3)	94 (47)	165 (82.5)	11 (5.5)	36 (27.7)	32 (24.6)

Table 8. Cultural restrictions

Survey data showed that 60% (120) of girls in Achham and 17% (34) of girls in Bajura practiced *chhaupadi*. In Bajura, 83% of girls couldn't sleep in the same bed as others. Eighty percent (159) of girls in Achham, and 90% (179) of girls in Bajura were restricted from eating certain foods. Other common restrictions forbid menstruating girls from touching or going near livestock (particularly milk producing livestock), cow dung, crops or fruit producing trees because their touch could make animals barren, stop milk production, make fruit rotten, kill crops and plants. Mothers and teachers said that it was important to keep menstruating girls away from men who wore a sacred thread, and "pure" substances related to the Hindu goddess Laxmi (cow dung, cows, and milk products). Girls' understanding of the reasons for restrictions somewhat differed, but the effect was the same: "During menstruation, we should not carry cow dung as we might be infected with tetanus. My elder sister was infected" (Parsa FGD 102).

Survey data showed that most girls followed restrictions because they were either scared of divine retribution, harming others or themselves or they were restricted by family members (Table 9). Qualitative findings suggested that many girls sought to respect their family by following traditions. Girls said that poor families, joint families or families of a high social class were most likely to maintain restrictions: "There are more old people living in joint families and they control us more during menstruation" (Achham FGD 301). Girls discussed the consequences of not following restrictions: "If we – the high class family – don't follow restrictions during menstruation then our social standing will go down" (Achham FGD 301). Teachers felt pressured to follow community traditions to maintain their reputation: "You have to follow restrictions otherwise people here will say: 'Sir ate the food cooked by his wife, or cooked by other menstruating women.'" (Udaypur SSI Teacher 316). Eating pickles and sour foods were believed to cause heavy bleeding in all districts. Heavy bleeding was also believed to be caused by lifting heavy loads in Parsa, Udaypur and Sindhuli. Some girls resisted restrictions, but they were fearful that in doing so they were endangering their family and that they would be blamed for any misfortunes.

Only 17% (149) of girls reported having their movement restricted while menstruating, but this may be because their movement was limited even when they were not menstruating: "Here, they do not allow us to go outside the house very often. People in society frown on us going out alone. They say we are carelessly roaming around" (Achham GI 303). Some girls didn't like to go outside while they were menstruating because of physical discomfort, fear of leakage (and others seeing their menstrual blood) or fear of doing something they were not meant to do: "If we go out we are worried...people get angry if you walk in the roads where there is a temple, so they do not let you go there" (Achham FGD 301). This was also reported by mothers: "Everyone gets afraid of touching things and people, and getting scolded" (Sindhuli SSI Mother 413).

Reasons for Restrictions N (%)									
Girls (N=860)	Don't feel well	Fear divine retribution	Family don't allow	Don't want to	It is the right thing to do	People touched will become unwell	Food will be ruined	Will have heavy bleeding	Other
Restriction: Cannot visit religious place									
846 (98.4)	3 (0.4)	433 (51.2)	380 (44.9)	8 (0.9)	15 (1.8)	0 (0)	0 (0)	0 (0)	7 (0.8)
Restriction: Cannot attend religious occasion									
678 (78.8)	4 (0.6)	296 (43.7)	341 (50.3)	17 (2.5)	14 (2.1)	0 (0)	0 (0)	0 (0)	6 (0.9)
Restriction: Cannot worship in the household									
839 (97.5)	1 (0.1)	415 (49.2)	385 (45.6)	7 (0.8)	13 (1.5)	0 (0)	0 (0)	0 (0)	18 (2.1)
Restriction: Cannot touch male family members									
390 (45.3)	0 (.0)	48 (12.3)	194 (49.7)	5 (1.3)	3 (.8)	130 (33.3)	0 (.0)	0 (.0)	10 (2.6)
Restriction: Cannot cook food or enter inside kitchen									
562 (65.3)	24 (4.3)	59 (10.5)	385 (68.5)	3 (0.5)	6 (1.1)	0 (0)	82 (14.6)	0 (.0)	3 (0.5)
Restriction: Cannot go outside as much as normal									
149 (17.3)	14 (9.4)	17 (11.4)	82 (55.0)	20 (13.4)	6 (4.0)	0 (0)	0 (0)	0 (0)	10 (6.7)
Restriction: Cannot eat food or drinks of their choice									
512 (59.5)	74 (14.5)	73 (14.3)	258 (50.4)	10 (2.0)	9 (1.8)	0 (0)	0 (0)	84 (16.4)	4 (0.8)
Restriction: Cannot sleep in the same household as others									
159 (18.5)	2 (1.3)	23 (14.5)	130 (81.8)	0 (0)	3 (1)	0 (0)	0 (0)	0 (0)	1 (0.6)
Restriction: Cannot sleep in the same bed as others									
338 (39.3)	4 (1.2)	40 (11.8)	227 (67.2)	22 (6.5)	17 (5.0)	0 (0)	0 (0)	0 (0)	28 (8.3)

Table 9. Restrictions and reasons for those restrictions

Discussion

It was challenging for girls to confidently manage their menstruation in all districts. In Bajura and Achham, there were more menstrual restrictions than in other districts, and in all districts many girls feared divine retribution if they worshipped in temples or at home. In Parsa, Sindhuli and Udaypur, girls feared spreading infection and being cursed if their menstrual blood was seen.

Girls' participation in school and community life was restricted because of these beliefs.

Knowledge and Information

Our study and others have found that girls were usually ill-informed and unprepared at menarche (Chandra-Mouli & Patel, 2017). When girls are informed, they feel confident in managing first and subsequent menstrual periods (Marvan & Molina-Abolnik, 2012; Sumpter & Torondel, 2013). We found that information was acquired from mothers, sisters, friends and sometimes teachers, yet this was not always skills-based or accurate. Information often focused on maintaining menstrual restrictions. Interventions enabling peer education can be effective in providing knowledge and increasing confidence (Abedian, Kabirian, Mazlom, & Mahram, 2011; Hytell et al., 2017; Posner et al., 2009), but our study and others show that it is also important to empower mothers, teachers and other stakeholders with accurate information about menstruation. Empowering these stakeholders enables them to support confident menstrual management, answer questions from boys and girls and challenge harmful restrictions (Hennegan & Montgomery, 2016).

We found that inaccuracies in teaching about adolescent hygiene and menstruation may reinforce beliefs about illness being caused by menstruation. Skills-based teacher training on how to teach menstrual management could improve access to accurate information (D. Joshi, Buit, & Gonzalez-Botero, 2015). Girls and teachers often find it difficult to talk about menstruation in mixed gender environments (Pokharel, Kulczycki, & Shakya, 2006). Gender disaggregation of classes, and involving female nurses in menstrual education may be effective in rural contexts where there is a shortage of female teachers (Borawski et al., 2015). Adolescent health training by NGO personnel can be *ad hoc*, and could be supplemented with systematic engagement with local health facilities. Teaching should respond to questions, teach beyond the physiology of menstruation, and give girls and boys the chance to question taboos and restrictions in a safe space (Sommer, Sutherland, & Chandra-Mouli, 2015).

Material Environment

It is important that girls are able to make informed choices about menstrual management materials, and understand the effect that they have on their health. Clear and accurate information about materials should be given to teachers, mothers and girls. Girls in our study expressed discomfort with both cloth and pads, which may be due to infrequent changing of materials (Mason et al., 2013). We found that girls were motivated to maintain good menstrual

hygiene, but their environment made this challenging. Adequate school changing facilities, waste disposal and regular clean water supply are key in developing confident menstrual management and could be enabled through multi-sectoral approaches between WASH, education and health sectors.

Girls' assessments of reliability, comfort and satisfaction with changing, washing, carrying and disposing of materials should be at the forefront of intervention design (Hennegan et al., 2016). Reusable pads have been promoted as an environmentally sustainable approach to menstrual management, but our research showed that they were not suitable for all girls. There is limited evidence about their effectiveness in improving participation in school or community life, improving psychosocial health and physical health (Hennegan & Montgomery, 2016; Montgomery et al., 2016). Increased accessibility of materials that are cheap, clean and easy to dry and dispose of would benefit girls. Further studies of menstrual cups are warranted as they may be locally acceptable (Oster & Thornton, 2011), they may decrease the risk of lower bacterial vaginosis (Phillips-Howard et al., 2016) and disposal infrastructure is not required. For girls who prefer cloths or disposable pads, community waste disposal strategies should be designed in collaboration with women to ensure their needs are met (Mahon & Fernandes, 2010). Waste disposal infrastructure could eliminate girls' stress of others seeing their menstrual blood, and the stress of being accused of environmental pollution.

Social Environment

Menstrual restrictions were enforced by the older generation, often in joint family households, and traditional beliefs upheld by influential community members such as teachers. Following menstrual restrictions was important to maintain social status. This indicates the importance of engaging the wider community *and* girls in designing and enacting strategies to address harmful practices. Girls need support to push boundaries in a context which seeks to constrain and protect them as they transition to adulthood (Bennett, 1978; Cameron, 1998). Community groups working through participatory learning and action cycles have proven effective in changing community behaviours and improving newborn and maternal health in LMICs (Prost et al., 2013). This approach of locally defining, planning and implementing strategies to address problems enables community-led and locally acceptable action, and could be used to improve menstrual management.

Limitations

We were unable to explore issues affecting out-of-school girls, and data collection in larger schools may have excluded girls from remote areas.

Despite these limitations, our study findings are valid for the contexts in which they were collected, and can inform intervention development.

Conclusion

In order to better meet the needs of girls, we need to hear their stories.

(Kirk & Sommer, 2006, p. 11)

In this paper, we have used girls' experience of menstruation in five diverse districts of Nepal to inform recommendations for policy and practice. Girls' needs were not being met, and restrictions excluded them from participating fully in school and community life. Jackie Kirk felt it was important to put girls at the centre of programming, to address inequalities and develop confident menstrual management. We heed the legacy of Jackie Kirk in advocating for cross-sectoral collaboration to address girls' needs, as well as developing the knowledge and skills of girls, mothers, teachers and community workers to enable confident menstrual management. In doing so, care should be taken to communicate accurately in ways which do not reinforce harmful social norms. Participatory community-wide engagement to develop locally relevant strategies may enable harmful social norms to be addressed and increase girls' participation in school and community life.

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