Understanding Gendered Sanitation Vulnerabilities: A Study in Uttar Pradesh

Report

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Background

In 2013, WSSCC and SHARE supported four studies aimed at expanding the evidence for how women and girls in India are affected by poor access to water, sanitation and hygiene (WASH). Women and girls, who are often the most impacted by the lack of access to adequate sanitation, do not often participate in sanitation and development planning. The findings from these four research projects were focused on sanitation practices and the psychosocial impacts of limited services on women in specific geographic / cultural contexts. Findings included: a conceptual framework for SRPS (sanitation-related psychosocial stress (Hulland et al. 2015)); the dynamic nature of sanitation related behaviours and stressors for women (Hulland et al. 2015); women's experiences and responses to sanitation related violence; and a self-reported scale for measuring sanitation-related psychosocial stress (Chase, R. P. et al. 2015).

Poor sanitation access and poor sanitation conditions can influence women's physiological and mental health (Kulkarni, O'Reilly, and Bhat 2015; Hirve et al. 2015). Women feel ashamed to be seen going to defecate or to change sanitary absorbents in public. Additionally, women's stress due to poor sanitation conditions also varies based on their stage in the life course (Sahoo et al. 2015). Levels of stress also fluctuate when there is a need to go out during certain times of the day or in certain seasons. In response to the shame and fear associated with OD (open defecation), women restrict their movements and discipline their bodies so that the need to defecate does not come at inconvenient or unacceptable times.

Recent studies show a relationship between unsafe sanitation and violence against women. These include sexual violence, assaults, harassment and a general feeling of insecurity while commuting to and from the defecation sites, or while accessing latrines near their homes after dark (Sommer et al. 2014; Amnesty International 2010; Winter and Barchi 2016). Women and girls' stress levels vary across age, occupation, caste, and a number of other cross-cutting and intersecting socio-demographic characteristics.

Aim

The aim of this study was to understand rural women and girls' age-specific experiences of using and accessing sanitation. The study focussed on the accessibility of latrines and the conditions of sanitation experienced across age, religion, caste, etc. The study objectives were informed by research indicating that women and girls have unique needs, and that these needs vary between urban and rural environments (Sahoo et al. 2015; Simiyu 2015; O'Reilly 2015). Specifically, we were interested in assessing the gender, caste, and age-specific experiences of SRPS that rural women and girls experience, and to suggest ways that SDG indicators and guidelines for Swachh Bharat Mission—Rural (SBM) in India might be adjusted to be more sensitive to the unique needs and stresses of rural women and girls without access to sanitation.

Rural Uttar Pradesh

Study design

This study used a triangulation design in which two data sets, one qualitative and one quantitative, were collected independently, interpreted independently and then synthesised. Our method was informed by recent research on SRPS that relied heavily on quantitative or qualitative methods (Sahoo et al. 2015; Hulland et al. 2015). We chose a two-phase, triangulation design that could capture both women and girls' experiences in narrative format and provide statistical measures of women and girls' SRPS.

In the first, qualitative phase, we used group discussions to explore SRPS and its causes in light of the unique social and geographic contexts of the proposed study area. The findings of the qualitative research were used to inform the second, quantitative phase of the research—a survey of women and girls' experiences of SRPS. This quantitative phase used pre-existing measures that were adapted and modified to reflect context-specific findings from the qualitative phase. These context-specific findings were incorporated in the period after the qualitative data was collected and the quantitative data had yet to begin. These findings included knowledge of social norms and local conditions including: caste tensions; water sources available for hygiene; lack of pit emptying services; landlessness of lowest castes; a general lack of toilets or unusable toilets in the area despite interventions; and the use of latrine structures for bathing, if available. These elements form the larger context of: patterns and variations of sanitation use; behavioural regulation practices; and key sources of sanitation-related stress.

We present the methods and results of both phases separately with a combined discussion.

Site Selection

Uttar Pradesh, India: Uttar Pradesh (UP) has low coverage rates of latrines (less than 36%) and slow annual growth of latrine coverage (less than 1.5% (Bonu and Kim 2009)). The most common type of latrine for UP rural households are pour flush pit latrines (Government of India 2011). More than 77% of the rural population practices open defecation (Office of the Registrar General and Census Commissioner, India, 2012). Rural areas in UP are characterised by communal segregation based on caste.

Amenities: The study villages were located in the interior parts of Jaunpur district. Though there were proper roads connecting the villages, public transport was not available. Electricity was sporadic. Women reported that they received only a few hours of electricity daily. Though all the villages had Anganwadis (kindergarten) and primary schools, few had secondary schools and children had to go to secondary schools in nearby villages.

None of the villages had access to health care services inside the village, meaning that there was no Auxilliary Nurse Midwife/Female Health Worker or Male Health Worker in these villages. Two of our study villages had ASHA (Accredited Social Health Activist) workers; ASHA's are tasked with promoting

health messages and connecting villagers to health services outside the village. The nearest primary health centre to any study village was 5-6 kilometres away with no public transport access.

There were no reported piped water schemes. In three of the study villages, people used public hand pumps, reported as insufficient to meet daily household requirements. In the other villages, households had invested in installing their own handpumps.

Communities and occupation: Families in the region typically have either small landholdings or were landless. People cultivated food grains mostly for their own consumption, and also worked as labourers. The three most common castes in the study sites were: 1. Chamars (leather workers), who belong to the Dalit caste (officially a Scheduled Caste), considered to be the oppressed and most exploited sections within the caste hierarchy; 2. Ben Bansi who are traditionally a basket weaving community, and practiced basket making and agriculture in the study villages; and 3. Yadavs (officially an Other Backward Class), who are higher than Dalits. They often hold dominant positions in social, religious and political matters in society. Overall, the Yadav communities were better-off than the Dalit (ex-untouchable, including Chamar caste) communities.

Phase 1: Qualitative Phase

Methods

Village Selection

Part 1**:** Part 1, also called the 'preliminary phase' was conducted in September 2015 in Jaunpur district. Data collection for this phase was done in partnership with a UP-based organisation called Dynamic Action Group (DAG), which has been working in the area since 1999. Shahganj sub-district in Jaunpur District was purposefully selected for the study due to the long-term presence of DAG there. Three study villages were selected based on sanitation coverage reports of the Census of India, 2011.

The study villages of part 1 characterised of three kinds:

Village 1: Where latrines were constructed under a national housing scheme for Dalits

Village 2: Where no sanitation was reported

Village 3: Where total sanitation was reported

Part 2**:** Following Part 1, four additional villages and Village 3 from Part 1 were selected for data collection in neighbouring areas of Jaunpur district. Implementation of a sanitation scheme in the villages was the main criterion for village selection, although we were aware that a sanitation intervention did not necessarily mean all households would have latrines. The GOI Census 2011 was used to select four villages from two blocks where the Total Sanitation Campaign had been implemented in Jaunpur district. Village 3 was selected for Part 2 of the study to follow up on the semi-structured interviews of Part 1 with group discussions.

Selection of participants

In each study village, women were invited to participate in Group Discussion (GDs) about sanitation experiences and sanitation-related stress. In some villages, GDs were complimented with semi-structured interviews with specific respondents. Participant selection varied in Part 1 and Part 2.

Part 1: A total of two large GDs and one semi-structured interview were conducted in three villages. Village selection was based on a detailed day-long meeting with DAG, to understand their work related to sanitation in the district. The participants were women involved in DAG's activities in their villages. In all, 40 adult women and five 14 and above girls participated. All were from the Dalit community.

Part 2: A total of six GDs and 3 semi-structured interviews were conducted with participants from households with and without latrines. GDs were held in an open space in each caste-based neighbourhood of the study villages, i.e., in each village a GD was held for women of majority caste groups. Adolescent girls age 14 and above, and women across all age groups self-selected for GDs. In all, 36 women/12 girls from the Dalit caste, and 13 women/3 girls from the Ben Bansi community participated in GDs. A majority of the respondents belonged to the Chamar caste (the majority caste group in the study area)

Three semi-structured interviews were conducted with a few households that had latrines and/or were in minority communities of the village. These households were purposefully selected during the researchers' walk through the village neighbourhoods. They included 3 women/2 girls in the Yadav community and 2 women in a Muslim household.

Public group discussions in a rural, Indian setting are usually boisterous and bystanders come and go, depending on obligations and interest. For this reason, all women and girls present were consented, but not all spoke. Women and girls participating were not individually asked about their household sanitation conditions, age, and caste. As GDs happened in caste-based neighbourhoods, caste was known. Age-group was determined by the field team, and sanitation conditions for the neighbourhood were generally the same for all women present. Additional individual information was voluntary. As the purpose of the qualitative research was to capture women and girls' experiences in their own words, and quantitative data collection would capture socio-demographics in detail, it was pre-determined that GDs would follow the format and flow typical of group discussions in this area, thereby enabling topics important to women and girls emerge organically and conversationally.

Data collection

Each GD lasted for an average of 40 minutes. The GDs and semi-structured interviews were moderated and conducted by fieldworkers from DAG (part 1) and the research team (part 1 and 2) in the local dialect and in Hindi. Oral informed consent was obtained from the participants.

The researchers asked women and girls about household sanitation conditions, their sanitation habits, if they used latrines, and the reasons behind constructing latrines in their houses. They were also asked about the sanitation schemes in which they participated for getting a latrine constructed in their house.

A note-taker took written notes of all the data collection events. Recorded fieldnotes indicated if a girl (14-18 years), older woman (45+ years), or pregnant woman was speaking. Women in their middle years were not noted as such, as they formed the majority of respondents. (Newly married women did not

participate in GDs due to cultural norms.) Data from the written notes were transcribed and translated into English by the research team for data analysis. Codes were developed through an iterative process and MAXQDA software was used to code translated datasets.

Data analysis

The translated data was summarised based on the themes and objectives of the study. A mixed approach of deductive and inductive (line-by-line) coding was used for generating themes, codes, and sub-codes of the data summaries. Detailed code memos were written for each code and sub-code. The codes and code memos were mutually agreed upon and validated by the study team. These codes were then used to code text segments from the summaries of the data. The process of coding and generation of text segments was done using qualitative data analysis software MAXQDA 12. The coded segments were further analysed along themes and SRPS, the results of which are below.

Qualitative Results

The following sections describe the various elements of psychosocial stress and the various mitigation strategies that women undertake to deal with their PSS on a daily basis.

Sanitation Access

With the exception of Village 1 in Part 1, all study villages had had a sanitation intervention. Village 2 (Part 1) households had gotten support for building houses and latrines through the national scheme for poor families, Indira Awas Yojna. Women here reported that the amount was insufficient to build a house and a latrine, so only latrine walls were built. (Presence of latrine walls made it possible for the structure to be approved, and the final tranche to be paid to the household.) Village 3 (Part 1) households had latrines hastily built through the Clean India Prize (Nirmal Gram Puraskar). Villages visited in Part 2 all had government latrine-building interventions, but nearly all were non-functioning.

Faulty construction, such as shallow pits, collapsed walls, and roofs damaged by the monsoons were common characteristics of most of the latrines present in all the communities. Other women showed us their government-subsidised units that had never been completed. Lack of usage of latrines were indicative of the poor construction or inconvenient infrastructure (e.g., absence of a door). In some cases women used the latrines for post defecation cleaning or bathing by erecting a curtain in lieu of a door. Some households used them as storage spaces, and others abandoned the latrines.

Occasionally, latrines were built along the main road traversing the village, with doors facing the road. Women expected to use these units were vocal about never using a unit that afforded no privacy when coming or going to use it. These women reported that they were not included in the latrine construction decision-making process.

Among all the women who participated in the data collection processes, only 5-6 women reported currently having a functioning latrine at home. (In one GD, women told us that other households in their community had latrines, but the women of these households did not participate in the GD for unknown reasons.) The motivations mentioned for building latrines were someone being ill or incapacitated in the family, or for use for young daughters/ daughter-in-laws. “There are no proper roads, so how can our

daughters-in-law go through the village for OD?," an older Muslim woman told us. Her family built a latrine because their daughters in-law had to pass through neighbours' property to go out for OD. Another woman who used a household latrine was disabled.

Women often said that the latrines were just built *'for show'*, to fulfil the requirements of the scheme. In one of the villages women said that some good latrines were built only near the entrance of the village to demonstrate the implementation of the scheme to visitors. A woman in another village said that even though they already had a latrine of their own, the village headman (Pradhan) insisted and built another one in their courtyard, because it was the requirement of the scheme. By contrast, a group of Dalit women told us that, "The Pradhan belongs to an upper caste, and has not provided any amenities to this village." Women in our study who reported building a latrine were typically from wealthier households than others. Only two women with latrines mentioned receiving financial assistance from the village scale government.

No study villages had public latrines. In one of the GDs, public latrines were suggested by a young woman as a possible solution, given the lack of financial capacity to build private latrines. However, older women countered, saying that public latrines will not work due to many reasons such as: maintaining cleanliness, conflicts over it, time spent in line, finding space for public latrines, etc. There was little enthusiasm for public latrines in the community.

Sanitation access was also poor at local schools. The girls from all the villages, except one, reported that the school latrines were "too dirty" to use. In one GD, the girls also said that the latrine was used by the male teachers, and never cleaned. In another GD, they said that neither the teachers nor the students had used the latrine for a long time, because it had not been maintained. Girls also expressed that they were embarrassed to use latrines in the presence of boys, so they went to nearby fields instead. College-going girls said that the latrines in college were in better condition, and that they used them.

Practices of open defecation

Location: Women without latrines at home mostly used empty fields for OD once the crops were cut. Since they cannot use fields during the agriculture season they go to common village lands where there is some cover, or simply use the sides of the roads. Women in one of the villages reported using the land in the cemetery. One woman told us, "There is filth in every direction." In most of villages, men and women used different places. However, where men and women used the same places, women had to go very early in the morning to avoid encountering men.

Seasonality: Women had to adjust their places for OD depending on changing seasons. Navigating water and mud during the monsoon season, needing to go out at times of heavy rain, and flooding were all described as unpleasant and unavoidable. One Dalit woman reported that she slipped and fell in an unseen pothole. In one of the villages women showed the team big umbrellas that they were given by the local government to use for OD during the monsoon rains.

Time: Most women said that they went twice a day, morning and evening. Since there were people around during the day, and finding a covered place was difficult, they avoided going during the daytime

unless it was an emergency. The time to go in the morning differed among women, with no clear pattern of age or caste. Some women said that they went before daybreak to avoid being seen, and to find a place easily, “If we get up early then there is no trouble finding a place”. Others said that they did not want to go when it was dark, because they were not able to see insects or animals.

Physiological health: Information on physiological health was not solicited during GDs, but was brought up by women as part of the discussion. In the first two GDs conducted during Part 1, women steered the discussion by talking about how OD impacts their physical health. They mentioned their risk of urogenital diseases from going to defecate in the open spaces. In Part 2, women mentioned difficulties during menstruation and pregnancy.

Sanitation-Related Psychosocial Stress

Not all women expressed feelings of stress, inconvenience, or discomfort with OD practices. An elderly woman mentioned that she enjoyed going out because *“Achi hava aati hain”* (I like to feel the fresh air). While another from the Ben Bansi community said, “For generations we have gone out for OD”. For some women not having access to a latrine was stated as, "OD is just fine”. Other women did not recount OD as stressful, even while they were unwell. They had created adoptive strategies such as, “You can shit in a pot and throw it later”.

In Part 1 of data collection, in the presence of DAG fieldworkers, women respondents did voice incidences of sexual violence; it is possible that women felt more comfortable speaking to the research team in the presence of DAG members that they trusted. It is also possible that DAG fieldworkers would know if women were not forthcoming, so women were truthful; and it is possible that researcher bias may have influenced women to say what the field team wanted to hear, based on what women were told about the study goals.

In Part 2, respondents did not always openly speak about fear of being harassed, attacked, or embarrassed. Nor did women speak directly to being stressed or experiencing stressful situations. As topics of violence and harassment are sensitive, and even taboo, we did not expect all women to be forthcoming on these issues, but rather, to convey their knowledge or experiences obliquely. For example, women seldom reported any wrongdoing perpetrated by someone in their own villages; instead these incidences happened in other places. Our findings below use women's direct words of fear of harassment; embarrassment; and fear of attack, as well as interpretations of the various responses given by women and girls throughout the GDs.

Fear of harassment: In most GDs, women said that they had not experienced any harassment/violence when they went for OD, nor had they heard about such incidences. In a village of a single caste group, women said that since it is just one community, they do not fear harassment. In other GDs, the type of harassment mentioned was field owners chasing off women seen defecating in their fields. Chamar women mentioned specifically being harassed by upper caste landowners. This type of harassment is

tied both to caste, and to landlessness, as women from landless families (who were Chamar) had no where to go for OD but the lands of their Yadav neighbours.

Embarrassment: The women were '*embarrassed*' to be seen by men. If men passed them by, they had to stand up and wait till the area was clear again. "If we don't they will say what a shameless woman she is!," one woman said plainly. Women were blamed for being unashamed of being seen by men if they did not stand up, even while defecating. One woman from the Yadav community said that they built their own toilet, with some financial help from the local government, because she has young daughters, *"Ladkiyan bahar jati hain, to sharam aati hai, isliye banva liya"* (Girls go outside, so they feel shame. For this reason, we built a latrine). Moreover, most of the women and girls did not carry water for cleaning when they went for OD. They said they were embarrassed to carry it. They performed anal cleansing once they were back home. Apart from the inconvenience caused by commuting to distant OD sites, women also expressed their embarrassment in taking their guests out for OD, as one of them mentioned, "If you have a toilet you won't have to go far; you won't have to take a guest out."

Fear of Attack: In one of the GDs, older women talked about fear of snakes, scorpions and other insects when they went for OD. "If you get bit by a *khide* (centipede) then there is no cure", said one Chamar woman. Women conveyed feelings of fear from animals and from male attack. In one case where women were using the cemetery for OD, they talked about being afraid of ghosts. Women also spoke of fear as an element of everyday life that they are habituated to.

Young girls also talked about fear of attack. Girls said that even though nothing has happened yet, they were afraid that someone might come and attack them especially when it was dark, and there were bushes around. Girls were also scared of thieves, "*Chor badmashonse dar lagta hai."* (We are afraid of thieves and bad behaving men/boys). In one of the GDs with a Chamar community, women said that they had heard that girls of neighbouring villages were kidnapped when they went for OD, although this had not happened in their village. (As mentioned above, one way of acceptably talking about actual violence was to discuss the incident as having occurred somewhere else.) "Something will happen", expressed a mother from one of the Chamar communities. "You cannot trust other people", mentioned another, while expressing concern for their young daughters and daughters-in-law. Mothers worried about their daughter's safety.

Behavioural Modification

The women adopted several strategies to mitigate SRPS. These were daily practices, integrated into their normal daily lives. Not all women spoke of these habits or practices as intentional ways they mitigated stress. In fact, the 'normalization' of behavioural modification was made clear by the frequent, but easy manner, that women and girls' spoke of their behaviours in response to questions of "What are your daily habit/practices of defecation (or open defecation [if they did not have a toilet])?" Answers were given in matter-of-fact kinds of ways. Even when pressed, e.g., "Is that behaviour/condition a problem for you?", both women and girls more often than not, responded that it was not. Nevertheless,

the specifics that women spoke about indicated that they modified their behaviour in response to inadequate sanitation.

Open defecation companions: Respondents from all GD groups said that the young girls do not go by themselves. They were either accompanied by older women of the household or they went in groups. Women's preferences to go for OD alone or in groups varied across all age groups. Some women expressed that they could go to OD sites alone, while others said they always went in groups. Some said that they could go alone in the morning, but at night they preferred to go in groups. Unfortunately we did not ask about this behaviour more closely, as both morning and night OD times are in the dark, but women felt that the danger or discomfort were different at night. We speculate that women went in groups at night in the knowledge (and fear) that many men would still be awake.

Adjust the time for going for OD: Women reported that they preferred to go for OD when they were not seen, especially by men, but by others in general. Women awoke early in order to avoid them. It was a norm for the women to modify and adjust their body-cycle to behaviours, which were socially accepted as 'right' or 'wrong'. This was because in these communities, women could not allow themselves to be seen while defecating in the open. In case of upset stomach, women reported that they had to go during the day, despite shame, "We are seen, but what other option is there?".

Only in a village comprising only the Chamar community did women express that they could go at any time, because they "were all one family" (i.e., a single caste group). It was also only in this same village that an older woman said, "*Darne see kyaa hoga, kapde men todhi karenge*?" (What is fear, when you might mess [shit] your clothes?) Her response was a practical one, as she was not fearful in her own community.

Change places/ find alternate places: Dalit women that were chased off fields of upper caste farmers spoke of moving to the fields of some other farmer. In Dalit households that were landless, women had to go to fields belonging to upper caste farmers or hunt for alternate places to defecate. During growing seasons with sown fields, farmers were vigilant. "They do not allow and even shout at anyone who attempts to defecate in their fields", we were told.

It was Chamar women who spoke of having to make a choice to walk long distances because their own landholdings were too small and too near the village, or they had no land at all. This coping behaviour was a response to fears of being chased away, or the real threat of violence if they were caught defecating in others fields. As one middle aged woman said, "Fights happen if they [women] go in someone's fields." One pregnant woman said that she doesn't go to the OD place other women use—it is too far, but goes instead to a nearby place.

Women and girls also told us that they tried to reach places early enough to find a clean-ish spot, and that sometimes it was simply necessary to squat in a dirty place. For some women who went early, finding a clean-ish spot was part of their motivation, e.g., "If we get up early, then there is no trouble finding a place".

Older women controlled younger women: Most women in our discussions spoke of limiting girls' mobility and timing for OD so they could accompany them (daughters-in-law, or pubescent girls). As one mother said, "We are afraid for our young daughters. We do not let them go alone." Mothers would tell daughters what to do, and when to go. Girls had to adjust their needs to these directives, as well as the availability of other women to accompany them. However, girls spoke of traveling to OD sites in the company of their friends. The women in a single-caste village spoke of the security (for women and girls) in their village, because it was one big family.

Menstrual hygiene

For girls in schools with toilets too dirty to be used, neither urination, defecation, nor changing of menstrual cloths was thinkable. Girls were embarrassed to use a toilet that was also used by men/boys, one girl told us, *"Ladkon ke karan sharm aati hai" (*because of boys, I feel ashamed to use it). Although telling the teacher that they need to leave school because of their period is taboo, girls will ask to go home by saying that they have a headache or a stomachache. They are not always granted leave from school, but girls indicated that male and female teachers understood that a 'stomach ache' meant she was having her period.

During menstruation women either used cotton cloths or sanitary napkins/pads. In some cases young girls used pads, while women used cloth. The high cost of sanitary napkins was mentioned as a reason to choose cloth over napkins, in one GD of Dalit women and girls. Once used the cloth was disposed of (i.e., not washed and reused) by throwing it away or burying it. Some girls preferred practicing MHM in solitude and/or disposing of menstrual cloths in distant hiding places. A few spoke of going alone to throw away menstrual cloths.

Limitations

Women in their middle age were the most vocal participants in GDs, and many women spoke at once, so it was often that the most assertive women were heard. We purposely singled out women and girls outside the middle-aged category who indicated that they wished to speak, but could not get a word in. Nevertheless, the voices of older women and girls are under-represented in our data due to the method of data collection. It is possible that because GDs were held in public, women and girls were reticent; however, information learned in GDs did not vary widely from information learned in SSIs. Also, the data includes only women and girls who self-selected to participate in the discussions, but as interviews and discussions depend on consent, qualitative research accepts this potential bias. Triangulation of women and girls' experiences across the GDs and SSIs gives us confidence that we were able to capture the 'big picture' of SRPS for our study area.

Phase 2: Quantitative Survey

Methods

Sampling, sample size, and recruitment

Surveys were completed in 16 villages in the larger study area. This included 5 villages where GD discussions had occurred. Additional villages were recruited to increase the scope of the survey.

Survey instruments with pre-coded responses were developed and administered in a sample of 303 women. Because the survey was exploratory and descriptive, standard sample sizes calculations for hypothesis testing were not used. Instead, a sample of approximately 300 respondents was pre-determined as an appropriate balance between available resources and statistical precision.

This sample was distributed proportionally among participating villages according to population size as available in the 2011 Indian census data. Sampling interval within each village was determined by dividing the total number of households by the population-adjusted sampling target and proceeding to every kth household from a fixed starting point. To ensure that the entire village was surveyed and specific marginalised groups were not excluded, the field supervisor established multiple starting points throughout each community based on clusters of households / habitations.

At each selected household, the enumerator read a recruitment script and asked to complete a roster of all women 14 years or older in the households. From this roster, one woman was selected at random for recruitment, consented, and the interview completed.

Survey Instrument

Survey instruments reflected key preliminary findings from the qualitative phase, including: variation in patterns of sanitation use, behavioural regulation practices, and key sources of sanitation-related stress. Standard demographic indicators were collected, including income, life stage, age, and household composition. Self-reported use of sanitation facilities for a variety of behaviours – urination, defecation, menstrual hygiene management, bathing, etc. – were collected through the survey. In addition, a variety of novel measures specific to sanitation use and sanitation-related stress and vulnerabilities were included in the survey instrument.

To capture respondents experiences related to sanitation access, a sanitation-related psychosocial stress (SRPS) and distress, a series of 25 yes/no questions were included (Chase, R. P. et al. 2015). These questions, also piloted and validated in Odisha, correspond to three sub-scales: environmental stressors, social stressors, and gender-based violence stressors. Sub-scales and the complete SRPS were analysed together. For the scale, answers to individual questions are summed for each respondent. Scores can be generated for each sub-scale – Environmental Stress Score, Social Stress Score, and Gender-based Violence Stress Score – as well as a composite Sanitation-Related Psychosocial Stress Score (SRPS) reflecting the sum of each sub-scale. Higher scores are indicative of higher measured levels of SRPS.

A series of questions concerning experiences with defecation, cleaning after defecation, bathing, and menstrual cycle management in the last 30 days were asked of respondents, from which a 4-item behavioural modification index was created. The items included in the behavioural modification index

were if, in the last 30 days, the respondent had: 1) withheld defecation or urination to the extent that it was uncomfortable or hurt; 2) taken less food than you wanted in order to avoid or delay defecation; 3) had less water than you wanted in order to avoid or delay urination and 4) skipped washing or bathing or been unable to wash to your own satisfaction. The index was created by summing, giving a summary score ranging from 0-4, with 0 indicating the least behavioural modification and 4 the most.

Analysis

Analysis of survey results was completed in Stata v13.1 (College Station, Texas, USA). Descriptive statistics of all demographic variables and key outcomes (SRPS scale, General and Experiential Scales, and behavioural modification scale) were developed. Because all scales utilised in our study were based on binary variables, scale scores represent a simple sum of all responses favourable of the trait of interest. Bivariate analyses (analyses in which the relationship between two variables are compared without adjusting for other variables) examining the association between key outcomes (SRPS scores, SRPS sub-scales, and behavioural modification index) and selected socio-demographic and other indicator variables were conducted using Poisson regression, with the scale in question modelled as the dependent variable and outcomes presented as incident rate ratios. Wald tests were used to test the significance of categorical variables.

Quantitative Results

Demographics

A total of 303 households were included in this study with one woman 14+ interviewed from each household. Ages ranged from 14-75, with a mean age of 35.7 years. Nearly 80% (241/303) of the women were married and 7% (20/303) were widowed. Of those who had been married, the mean number of children was 3.38 with a range of 0-9. Two women reported being married in the last year and seven were pregnant at the time of the interview. More than three-quarters of the sample were Hindu (237/303), 15% (45/303) were Muslim and 7% (21/303) Buddhist. Over half of the women interviewed reported having no formal education (178/303). Women could identify as many occupations as they wished. The majority of women - 96% (291/303) - reported that being a housewife was one of their occupations. Additional occupations included: 22% (67/303) reported cultivators (self-employed – agriculture), 9% (28/303) reported agricultural labour for someone other than themselves, 13% (39/303) reported other daily wage labour outside the home, 5% (15/303) students, 4% (11/303) self-employed (ex. craft making), and 1% (2/303) reported “Other”. 18% (54/303) of household reported or had a verified BPL card at the time of data collection. See Tables 1 & 2 for household and socio-demographic data.

Table 1: Household data

Total # women 14+ in all households	760
Total # households/women interviewed	303
Percent of women from each category selected for interview:	% (N)
14+, never married	21.43% (42/196)
14+, married less than two years	12.5% (2/16)
14+, currently pregnant	30% (6/20)
14+, married more than two years; not pregnant	50.83% (183/360)
45+, married or widowed	41.67% (70/168)
Total:	39.87% (303/760)
Number of people living in the household	
Mean (SD)	7.62 (3.88)
Range	1 – 35
	% (N)
One or more males in the household, under 5 years	30.03% (91/303)
One or more males in the household, 5 – 14 years	60.07% (182/303)
One or more males in the household, 15 – 44 years	98.02% (297/303)
One or more males in the household, 45+	45.54% (138/303)
One or more females in the household, under 5 years	30.03% (91/303)
One or more females in the household, 5 – 14 years	53.79% (163/303)
One or more females in the household, 15 – 44 years	96.7% (293/303)
One or more females in the household, 45+	51.81% (157/303)
Who lives in the household?	% (N)
Own mother	14.19% (43/303)
Mother-in-law	22.77% (69/303)
Own daughter	57.09% (173/303)
Daughter-in-law	20.13% (61/303)
Sister	8.58% (26/303)
Sister-in-law	14.85% (45/303)
Does the household have a BPL card?	% (N)
No	82.18% (249/303)
Yes	17.82% (54/303)

Table 2: Socio-demographics

Age	
Mean (SD)	35.75 (12.77)
Range	14 – 75
14 – 24	18.48% (56/303)
25 – 34	26.73% (81/303)
35 – 44	32.67% (99/303)
45+	22.11% (67/303)
Marital status	
Single, never married	13.86% (42/303)
Married	79.54% (241/303)
Widowed	6.6% (20/303)
Of those who have been married:	
Number of children:	
Mean (SD)	3.38 (1.62)
Range	0 – 9
Married in the last two years?	0.77% (2/261)
Currently pregnant?	2.68% (7/261)
Age at first period:	
11	0.66% (2/303)
12	7.26% (22/303)
13	19.14% (58/303)
14	24.42% (74/303)
15	16.83% (51/303)
16	2.31% (7/303)
Don't know	29.37% (89/303)
Religion	
Hindu	78.22% (237/303)
Muslim	14.85% (45/303)
Buddhist	6.93% (21/303)
Caste/Tribe	
General	5.0% (15/303)
Scheduled caste	48.18% (146/303)
Scheduled tribe	0.66% (2/303)
Other backward caste	46.2% (140/303)
Highest education completed	
No formal education	58.75% (178/303)
Primary (1-5th year)	8.58% (26/303)
Secondary (6-10th year)	17.16% (52/303)
Completed +2 yrs or more (12th year – university)	15.51% (47/303)
Occupation	
Housewife only	47.85% (145/303)*
Generates income (agriculture, self-employed, daily wage labour etc.)	47.19% (143/303)
Student	4.95% (15/303)
Other	0.66% (2/303)

Sanitation Access and Practices

A quarter of women (77/303) responded that they had access to a toilet facility if they wanted it, all of which were identified as pour-flush latrines and all of which were reported to be located in the house or yard. 95% (73/77) of the households with a latrine reported that they didn't share the toilet facility with any other households. Among those with access to a facility, 77% (59/77) reported using the facility for urination, 83%(64/77) reported using the facility for defecation, 35% (27/77) reported using the facility for bathing, 31% (24/77) for changing clothes, 43% (33/77) reported using the facility for menstrual management and 3% (3/77) reported using the toilet facility for storage. Of those with a facility, less than half (45%; 35/77) reported that they viewed the facility as completely constructed. Open defecation was still widely practiced among respondents with access to a sanitation facility. Of the women reporting access to a toilet facility, 79% (61/77) reported going for open defecation at some point in the past 7 days. See Table 3 for details on toilet facility access and practices.

Table 3: Toilet facility access and practices

Is there a toilet they could use if they wanted to?	25.41% (77/303)
Reported using the toilet for: Urination Defecation Bathing Changing clothes Menstrual management Storage	 76.62% (59/77) 83.12% (64/77) 35.06% (27/77) 31.17% (24/77) 42.86% (33/77) 3.9% (3/77)
Facility is located in the house or yard	100% (77/77)
Households other than own that share the facility 0 1 5	 94.8% (73/77) 2.6% (2/77) 2.6% (2/77)
The toilet facility is fully constructed	45.45% (35/77)
Defecated in the open (field, bush, roadside, side of canal, etc.) at least once in the past seven days during the following times: Morning Afternoon Evening Night Any of these times in the past 7 days	 61.04% (47/77) 11.69% (9/77) 40.26% (31/77) 23.38% (18/77) 79.22% (61/77)

Sanitation-Related Psychosocial Stress

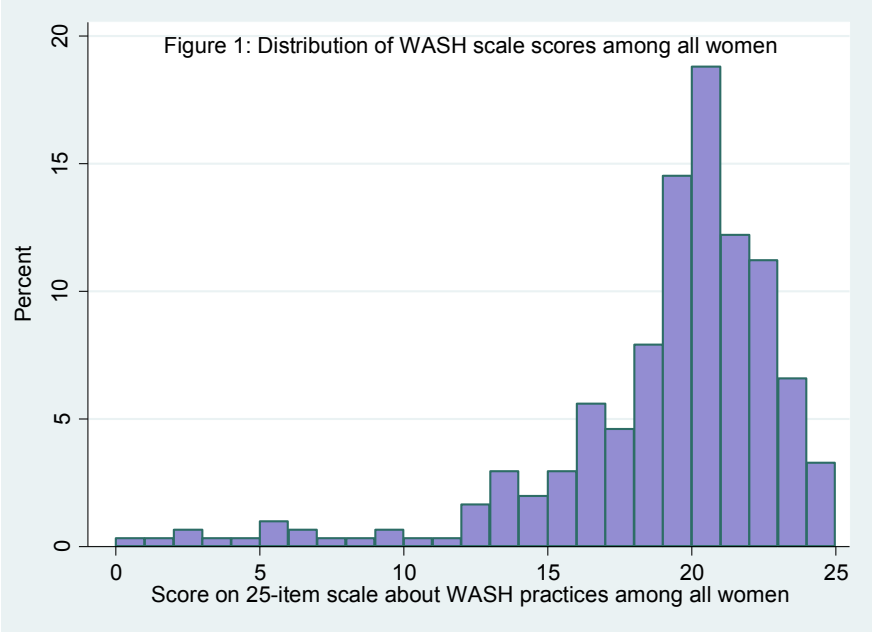
The mean SRPS score was 18.6 (SD 4.24) – women responded in the affirmative to approximately 75% to pre-identified stressors experienced in the last 30 days related to sanitation practices and use. Although direct comparison is difficult, these scores are much higher than scores found in previous studies where mean values on the same 25-item scale were between 6 and 10. The majority of women - 93%

(281/303) answered "yes" to over half (≥13 items) of the survey items. Table 4 and Figure 1 summarise the 25 item scale.

Table 4: Summary score all 25 items

Mean (SD)	18.59 (4.24)
Range	0 – 25
Tabulation of survey items	% (N)
answered "Yes"	2.97% (9/303)
0-5	2.31% (7/303)
6-10	9.90% (30/303)
11-15	51.49% (156/303)
16-20	33.33% (101/303)
21-25	92.74% (281/303)
Answered "Yes" to ≥13 items	

Figure 1: Distribution of WASH scale scores among all women



The SRPS scale consisted of three separate sub-scales – environmental stressors, social stressors, and gender-based violence stressors. Tables 5-10 give details of the environmental, social and gender-based violence scale items used in the 25 item scale. We present details of these sub-scales below as well as details on the individual sub-scales.

Environmental Stressors: The Environmental Stressors Score were measures with 8 items that characterised stressors related to their physical and built environment such as contact with animals, dirty water or mud, with 0 indicating the lowest degree of environmental stressors and 8 the highest. Environmental Stressors Scores ranged from 0-8, with a mean of 6.58 (SD 1.3), with 95% (287/303) of women answering "yes" to ≥50% of the 8 items. Among women that reported access to a toilet facility, Environmental Stressors Scores were on average 9% lower (IRR 0.91 CI 0.83 – 1.00, p=0.048). Access to a sanitation facility was the only variable that had a significant association at the p<0.05 level. See Tables 5 and 6 for details on the environmental subscale.

Table 5: Environmental factors, scale items

Have been scared they will get sick from rain or dirty water when going for defecation or bathing	95.38% (289/303)
Have been stressed by the distance they have to go to find a spot to defecate	85.48% (259/303)
Have been irritated by bugs insects or flies when going to defecate or bathe	95.38% (289/303)
Have been worried/stressed they will get sick or catch an infection from the place where they go for defecation?	91.69% (276/301)*
Have feared going for defecation in the night time or when it is dark	94.39% (286/303)
Could not find a clean spot for defecation at their preferred place?	52.98% (160/302)*
It has been too wet or muddy to use the site they prefer for defecation	76.16% (230/302)*
Have been scared of animals, such as snakes and scorpions, when going for defecation	95.05% (288/303)

Table 6: Physical summary score (8 items)

Mean (SD)	6.58 (1.3)
Range	0 – 8
Tabulation of social survey items answered "Yes"	% (N)
0	0.33% (1/303)
1	0.33% (1/303)
2	0.99% (3/303)
3	0.99% (3/303)
4	2.64% (8/303)
5	6.93% (21/303)
6	15.51% (47/303)
7	36.30% (110/303)
8	35.97% (109/303)
Answered "Yes" to ≥50%	94.72% (287/303)

Social Stressors: The Social Stressors Score comprised 10 items related to social stress, such as feeling shame or embarrassment because people can see them during defecation or bathing, or being worried that behaviours related to defecation could lower family or personal prestige. Social Stressors Score

ranged from 0-10, with a mean of 8.34 (SD 2.15) and 92% of women answering yes to ≥50% of the 10 items. Reporting access to a toilet facility (IRR 0.84 CI 0.77 – 0.92, p<0.001), reporting using the toilet facility for urination (IRR 0.74 CI 0.61 – 0.89, p=0.001) and reporting using the facility for defecation (IRR 0.74 CI 0.61 – 0.89, p=0.003) were each significantly associated with reporting lower Social Stressors Scores. See Tables 7 and 8 for details on the social subscale.

Table 7: Social factor scale items

Worried that behaviours related to defecation and bathing will lower family's prestige	92.08% (279/303)
Felt shame because people can see their defecation	91.09% (276/303)
Felt ashamed because other people see them change pads/cloths during menstruation	63.7% (193/303)
Felt anger or stress because they were not allowed to go to defecate or bathe WHERE they wanted	91.75% (278/303)
Felt embarrassed because people can see them when bathing	90.1% (273/303)
Been scolded for defecating or cleaning after defecation at a place where they were not allowed	78.88% (239/303)
Felt stress about how defecation and bathing practices will influence their personal reputation	89.44% (271/303)
Worried about the lack of privacy where they go for defecation or bathing	91.09% (276/303)
It has been difficult to find someone to accompany them when going for defecation	72.28% (219/303)
Felt stress about the time they have to wait to use their preferred spot for defecation	73.6% (223/303)

Table 8: Social summary score (10 items)

Mean (SD)	8.34 (2.15)
Range	0 – 10
Tabulation of social survey items answered "Yes"	% (N)
0	2.31% (7/303)
1	0.66% (2/303)
2	0.99% (3/303)
3	0.99% (3/303)
4	0.66% (2/303)
5	2.64% (8/303)
6	4.95% (15/303)
7	9.24% (28/303)
8	16.17% (49/303)
9	25.41% (77/303)
10	35.97% (109/303)
Answered "Yes" to ≥50%	91.75% (278/303)

Sexual-violence Stressors: The Sexual Violence Stressors Score score was made up of 7 items indicating experiences or the fear of harassment or violence when going to defecate or bath. Sexual Violence Stressors Scores ranged from 0-7, with a mean of 3.41 (SD 1.5), with 56% (170/303) women answering yes to ≥50% of the 7 items. Reporting access to a toilet facility (IRR 0.82 CI 0.72 – 0.95, p=0.006) and reporting using the toilet facility for urination (IRR 0.73 CI 0.55 – 0.97, p=0.03) were both significantly associated with lower Sexual Violence Stressors Score. Life stage and age were also significantly associated with Sexual Violence Stressors Scores, with the general trend being that currently married women aged 25-44 significantly more likely to have higher scores than adolescent women 14-24 (IRR 1.23 CI 1.02 – 1.49) while women 45+ or widowed lower scores than compared to adolescent women 14-24. See Tables 9 and 10 for details on the sexual-violence subscale.

Table 9: Sexual-violence scale items

Have been afraid of encountering men who have been drinking alcohol when going for defecation	91.09% (276/303)
Have had boys throw rocks or stones when they went to defecate or bathe	10.6% (32/302)*
Have feared they could be raped when going to defecate or bathe	66.01% (200/303)
Have been harassed by boys when going to defecate or bathe	23.18% (70/302)*
Feared they could be sexually assaulted when going to defecate or bathe	61.39% (186/303)
Have had boys or men reveal themselves to them while their trying to defecate, clean post-defecation, or bathe	3.63% (11/303)
Have been angry with boys / men who watched them defecate, clean post-defecation, or bathe	84.49% (256/303)

Table 10: Sexual-violence summary score (7 items)

Mean (SD)	3.41 (1.5)
Range	0 – 7
Tabulation of sexual survey items answered "Yes"	% (N)
0	3.63% (11/303)
1	6.27% (19/303)
2	21.45% (65/303)
3	12.54% (38/303)
4	34.65% (105/303)
5	14.85% (45/303)
6	5.61% (17/303)
7	0.99% (3/303)
Answered "Yes" to ≥ 4 items	56.12% (170/303)

Composite Sanitation-Related Psychosocial Stress Scores (Composite SRPS Score): For the combined SRPS scale, there were significant bivariate associates between the SRPS summary score and socio-demographic variables, life stage, age, religion, reporting access to a toilet facility and using the toilet facility for urination, defecation and bathing. Women who reported access to a toilet facility (93/303) had significantly lower Composite SRPS Scores than those who did not report access to a toilet facility (IRR 0.86, CI 0.81 – 0.91, p<0.001). Women who did have access to a toilet facility and reported using that facility for urination or defecation were more likely to have a Composite SRPS Score than those who did not use the facility for urination (p<0.001) or defecation (p=0.001). Conversely, reporting using the toilet facility for bathing was associated with a higher SRPS score compared to those who did not use the facility for bathing (IRR 1.14; CI 1.02 – 1.27, p=0.025).

Women who were currently married were more likely to have a higher Composite SRPS Score compared to adolescent never married women (IRR 1.07 CI 0.99 – 1.16, p=0.093), whereas widowed women and women 25+ had generally lower Composite SRPS Score than adolescent, never married women (IRR 0.95 CI 0.86 – 1.04, p=0.250). Overall, the life stage variable was found to be significantly associated with Composite SRPS Score at p<0.001 when using a Wald-test. Religion was associated with the SRPS summary score using a Wald test (p=0.043), with Muslim women being more likely to report a lower score than Hindu women (IRR 0.92 CI 0.85 – 0.99, p=0.028), and Buddhist women more likely to report a higher score than Hindu women (IRR 1.05 CI 0.95 – 1.16, p=0.332). Table 11 shows the bivariate associations. Figure 2 shows the 25-item scale by life stages.

Table 11: Bivariate associations between socio-demographic variables and 25-item SRPS scale

Socio-demographics	% (N)	Environmental	Social	Sexual violence	SRPS	p-value
Household reported access to a toilet facility	30.69% (93/303)	0.91 (0.83 – 1.00) p=0.048*	0.84 (0.77 – 0.92) p<0.001*	0.82 (0.72 – 0.95) p=0.006*	0.86 (0.81 – 091)	<0.001*
Reports using their toilet facility (of those who had one, N=77) for:						
Urination	76.62% (59/77)	0.86 (0.70 - 1.05)	0.74 (0.61 - 0.89) *	0.73 (0.55 - 0.97) *	0.78 (0.69 – 0.88)	<0.001*
Defecation	83.12% (64/77)	0.87 (0.69 – 1.09)	0.74 (0.60 - 0.90) *	0.78 (0.56 – 1.07)	0.79 (0.69 – 0.91)	0.001*
Bathing	35.06% (27/77)	1.09 (0.91 – 1.31)	1.17 (0.99 – 1.39)	1.15 (0.88 – 1.50)	1.14 (1.02 – 1.27)	0.025*
Changing clothes	31.17% (24/77)	1.10 (0.91 – 1.32)	1.13 (0.95 – 1.35)	1.13 (0.86 – 1.49)	1.12 (0.97 – 1.26)	0.057
Menstrual management	42.86% (33/77)	0.99 (0.83 – 1.19)	0.84 (0.71 – 1.00)	0.84 (0.65 – 1.10)	0.90 (0.80 – 1.01)	0.062
Storage	3.90% (3/77)	1.17 (0.76 – 1.80)	1.35 (0.93 – 1.97)	0.90 (0.44 – 1.82)	1.21 (0.93 – 1.56)	0.166
Life stage	-	p=0.284	P=0.142	*p=0.001	-	<0.001*
Adolescent (14-24), never married	13.86% (42/303)	Ref	Ref	Ref	Ref	-
Currently married women	63.04% (191/303)	1.07 (0.94 – 1.21)	1.01 (0.90 – 1.13)	1.23 (1.02 – 1.49)*	1.07 (0.99 – 1.16)	0.093
Widowed women and women 45+	23.1% (70/303)	0.99 (0.85 – 1.15)	0.92 (0.80 – 1.05)	0.94 (0.75 – 1.18)	0.95 (0.86 – 1.04)	0.250
Number of people living in household (Cont.)	-	1.00 (0.99 -1.01)	0.99 (0.98 - 1.00)	1.00 (0.98 -1.02)	0.99 (0.99 – 1.00)	0.230
Mean (SD): 7.62 (3.88)	-				-	-
Range: 1 – 35	-				-	-
Men and women living in the household						
Any males in the household	99.67% (302/303)	1.37 (0.57 – 3.30)	1.04 (0.52 – 2.08)	0.85 (0.32 – 2.27)	1.09 (0.68 – 1.76)	0.711
1+ males in the household, under 5 years	30.03% (91/303)	1.02 (0.92 – 1.12)	0.98 (0.90 – 1.06)	1.05 (0.92 – 1.20)	1.00 (0.95 – 1.06)	0.866
1+ males in the household, 5 – 14 years	60.07% (182/303)	1.00 (0.92 – 1.10)	1.00 (0.93 – 1.09)	1.04 (0.92 – 1.18)	1.01 (0.96 – 1.07)	0.706
1+ males in the household, 15 – 44 years	98.02% (297/303)	1.03 (0.75 – 1.41)	0.89 (0.68 – 1.16)	1.02 (0.66 – 1.59)	0.96 (0.80 – 1.15)	0.671
1+ males in the household, 45+	45.54% (138/303)	1.00 (0.92 – 1.09)	0.97 (0.90 – 1.05)	0.94 (0.83 – 1.07)	0.98 (0.93 – 1.03)	0.363
Any other females in the household	100% (303.303)	-	-	-	-	-
1+ females in the household, under 5 years	30.03% (91/303)	1.01 (0.92 – 1.11)	1.04 (0.95 – 1.13)	1.07 (0.94 – 1.22)	1.03 (0.98 – 1.10)	0.223
1+ females in the household, 5 – 14 years	53.79% (163/303)	0.97 (0.89 – 1.06)	0.97 (0.89 – 1.04)	1.04 (0.92 – 1.18)	0.98 (0.93 – 1.03)	0.507
1+ females in the household, 15 – 44 years	96.7% (293/303)	1.01 (0.79 – 1.28)	0.92 (0.75 – 1.14)	1.00 (0.71 – 1.41)	0.97 (0.84 – 1.12)	0.651
1+ females in the household, 45+	51.81% (157/303)	0.98 (0.90 – 1.07)	0.95 (0.88 – 1.02)	0.92 (0.82 – 1.04)	0.95 (0.91 – 1.00)	0.082
Age (Cont.)	-				0.998 (0.996 – 1.000)	0.122
Mean (SD): 35.75 (12.77)	-	1.0 (0.99 – 1.00)	1.0 (0.99 – 1.00)	1.0 (0.99 – 1.00)	-	-
Range: 14 – 75	-				-	-
Age (Categorical)	-	P=0.483	P=0.258	P=0.016 *	Ref	0.006*
14 – 24	18.48% (56/303)	Ref	Ref	Ref	1.05 (0.97 – 1.14)	
25 – 34	26.73% (81/303)	1.05 (0.92 – 1.20)	1.0 (0.89 – 1.13)	1.19 (0.99 – 1.43)	1.06 (0.98 – 1.14)	0.192
35 – 44	32.67% (99/303)	1.07 (0.94 – 1.21)	1.01 (0.91 – 1.13)	1.17 (0.97 – 1.40)	0.94 (0.86 – 1.02)	0.134
45+	22.11% (67/303)	0.98 (0.85 – 1.13)	0.91 (0.81 – 1.03)	0.93 (0.76 – 1.14)		0.155
Marital status	-	P=0.761	P=0.853	P=0.049 *	-	0.268
Single, never married	13.86% (42/303)	ref	Ref	Ref	Ref	-

Table 11: Bivariate associations between socio-demographic variables and 25-item SRPS scale

Married	79.54% (241/303)	1.05 (0.92 – 1.19)	0.99 (0.88 – 1.11)	1.18 (0.98 – 1.42)	1.04 (0.96 – 1.12)	0.290
Widowed	6.6% (20/303)	1.02 (0.83 – 1.26)	0.95 (0.79 – 1.14)	0.90 (0.65 – 1.24)	0.97 (0.85 – 1.10)	0.617
Of those who have been married:						
Number of children (Cont.):		1.00 (0.97 – 1.02)	0.99 (0.96 – 1.01)	0.98 (0.94 – 1.02)	0.99 (0.97 – 1.01)	0.198
Mean (SD): 3.38 (1.62)	-	-	-	-	-	-
Range: 0 – 9	-	-	-	-	-	-
Was married in the last two years	0.77% (2/261)	1.02 (0.60 – 1.72)	1.08 (0.68 – 1.72)	1.30 (0.67 – 2.51)	1.10 (0.81 – 1.49)	0.551
Is currently pregnant	2.68% (7/261)	0.85 (0.62 – 1.15)	0.75 (0.56 – 1.01)	0.90 (0.59 – 1.38)	0.81 (0.67 – 0.98)	0.035 *
Age at first period:	-	P=0.833	P=0.175	P=0.772	-	0.119
11	0.66% (2/303)	Ref	Ref	Ref	Ref	-
12	7.26% (22/303)	0.89 (0.53 – 1.49)	0.91 (0.57 – 1.44)	0.82 (0.39 – 1.70)	0.89 (0.65 – 1.21)	0.446
13	19.14% (58/303)	0.83 (0.50 – 1.37)	0.87 (0.55 – 1.35)	0.87 (0.43 – 1.76)	0.85 (0.63 – 1.15)	0.306
14	24.42% (74/303)	0.82 (0.50 – 1.35)	0.79 (0.50 – 1.23)	0.78 (0.38 – 1.58)	0.80 (0.59 – 1.08)	0.141
15	16.83% (51/303)	0.86 (0.52 – 1.42)	0.77 (0.49 – 1.20)	0.88 (0.43 – 1.79)	0.82 (0.61 – 1.11)	0.203
16	2.31% (7/303)	0.89 (0.51 – 1.57)	0.91 (0.55 – 1.51)	1.00 (0.46 – 2.19)	0.92 (0.66 – 1.29)	0.638
Don't know	29.37% (89/303)	0.89 (0.54 – 1.46)	0.86 (0.55 – 1.34)	0.87 (0.43 – 1.76)	0.87 (0.65 – 1.18)	0.371
Religion	-	P=0.091	P=0.077	P=0.387	-	0.043*
Hindu	78.22% (237/303)	Ref	Ref	Ref	Ref	-
Muslim	14.85% (45/303)	0.94 (0.83 – 1.07)	0.88 (0.79 – 0.99) *	0.96 (0.80 – 1.14)	0.92 (0.85 – 0.99)	0.028
Buddhist	6.93% (21/303)	1.16 (0.99 – 1.36)	0.92 (0.78 – 1.08)	1.15 (0.92 – 1.45)	1.05 (0.95 – 1.16)	0.332
Caste/Tribe	-	P=0.938	P=0.821	P=0.970	-	0.738
General	5.0% (15/303)	Ref	Ref	Ref	Ref	-
Scheduled caste	48.18% (146/303)	1.02 (0.83 – 1.25)	1.06 (0.88 – 1.28)	1.04 (0.78 – 1.41)	1.04 (0.92 – 1.18)	0.494
Scheduled tribe	0.66% (2/303)	1.03 (0.59 – 1.03)	1.13 (0.68 – 1.85)	0.92 (0.39 – 2.14)	1.05 (0.75 – 1.48)	0.771
Other backward caste	46.2% (140/303)	0.99 (0.81 – 1.22)	1.03 (0.85 – 1.24)	1.04 (0.77 – 1.39)	1.02 (0.90 – 1.15)	0.803
Highest education completed	-	P=0.849	P=0.851	P=0.630	-	0.504
No formal education	58.75% (178/303)	Ref	Ref	Ref	Ref	-
Primary (1-5th year)	8.58% (26/303)	1.05 (0.90 – 1.22)	0.99 (0.85 – 1.14)	1.10 (0.88 0 1.36)	1.03 (0.94 – 1.13)	0.555
Secondary (6-10th year)	17.16% (52/303)	0.97 (0.86 – 1.10)	0.96 (0.86 – 1.07)	0.93 (0.79 – 1.11)	0.96 (0.89 – 1.03)	0.266
Completed +2 yrs or more (12th year – university)	15.51% (47/303)	1.02 (0.91 – 1.16)	1.01 (0.91 – 1.13)	1.03 (0.86 – 1.22)	1.02 (0.95 – 1.09)	0.590
Household has a BPL card						
No	82.18% (249/303)	Ref	Ref	Ref	Ref	-
Yes	17.82% (54/303)	1.04 (0.93 – 1.16)	0.99 (0.90 – 1.10)	1.03 (0.88 – 1.20)	1.01 (0.95 – 1.09)	0.603

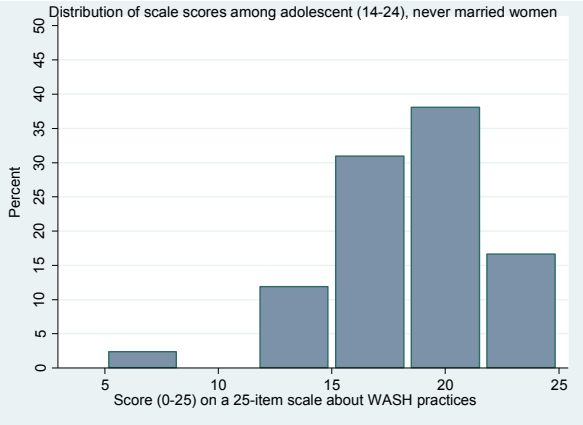
Table 11: Bivariate associations between socio-demographic variables and 25-item SRPS scale

Occupation						
Housewife only	47.85% (145/303)	0.97 (0.89 – 1.06)	0.98 (0.90 – 1.06)	0.97 (0.87 – 1.11)	0.98 (0.93 – 1.03)	0.377
Generates income (agriculture, self-employed, daily wage labour etc.)	47.19% (143/303)	1.04 (0.96 – 1.14)	1.01 (0.93 – 1.09)	1.03 (0.91 – 1.16)	1.02 (0.97 – 1.08)	0.336
Student	4.95% (15/303)	0.94 (0.77 – 1.15)	1.06 (0.89 – 1.26)	0.92 (0.68 - 1.23)	0.99 (0.88 – 1.12)	0.858
Other	0.66% (2/303)	1.17 (0.71 – 1.91)	1.20 (0.77 – 1.86)	1.33 (0.69 – 2.55)	1.21 (0.90 – 1.62)	0.199

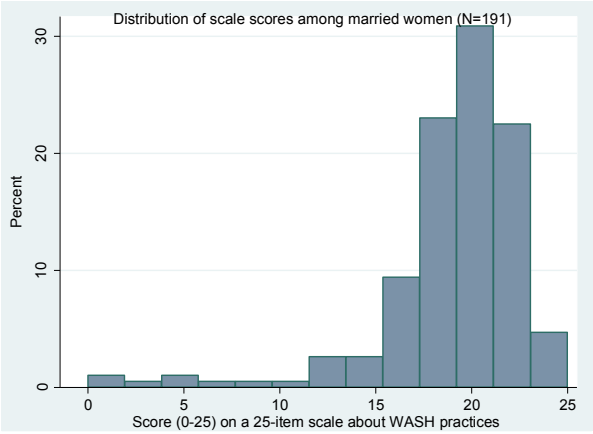
* P-value <0.05

Figure 2: S25-item SRPS scale by life stages

Adolescent (14-24), never married women (N=42)



Currently married women (N=191)



Widowed women and women 45+ (N=68)

Behavioural Modification Index

The behavioural modification index was created from four survey items in which women were asked whether or not they had felt the need to change their eating, drinking or bathing habits in the past 30 days in order to avoid or delay defecation, urination or satisfactory bathing. Responses were summed into an index, resulting in a value ranging from 0-4, with 0 indicating the least behavioural modification and 4 the most. Scores ranged from 0-4, with a mean score of 2.76 (SD 1.37). 80% (242/303) of all women answered affirmatively to ≥50% of the questions, while 13% (40/303) answered “no” to all four behavioural modification questions.

The behavioural modification index was found to be significantly associated with reporting access to a toilet facility (IRR 0.85 CI 0.73 – 0.99, p=0.037), with women having a toilet facility scoring 15% lower

than women without. Composite SRPS Score was significantly associated with behavioural modification index (IRR 1.12 CI 1.09 – 1.14, p<0.001. For each additional point on the SRPS scale, respondents scored 12% higher on the behavioural modification index. Tables 12 details the behavioural modification index and its bivariate associations.

Limitations

As stated above, standard sample sizes calculations for hypothesis testing were not used as this was an exploratory and descriptive study. Instead, a sample of approximately 300 respondents was pre-determined to balance available resources and statistical precision. Cultural practices in the low-income setting of rural UP impact sanitation behaviours and the stressors measured in this research. For this reason, some of the findings may be limited to low-income, rural areas of India with similar, gendered cultural norms.

Discussion

Findings from the qualitative and quantitative stages of our survey found what appear to be conflicting results. Women and the girls in GDs rarely spoke openly about social and sexual-violence stressors associated with lack of access to sanitation facilities in their houses, communities and schools. In contrast, measured sanitation-related stress was *very high* - the mean score was 18.6 (SD 4.24) and the large majority of women - 93% (281/303) answered "yes" to over half (≥13 items) of the survey items. To understand this discrepancy, it is important to examine the various understandings of stress and it's components employed within each method.

As women and girls spoke of going out for a variety of bodily needs, they were speaking of daily aspects of their lives, often taken for granted. They focused on the environment in which bodily needs are managed as normal and routine. Women did not discuss distance, time, cleanliness, or risk of infection as stressors (Sahoo et al. 2015)—these were conditions that had been normalised among respondents. In the quantitative component, Environmental Stressors Scores were based on pre-identified environmental stressors from previous studies (Hulland et al. 2015; Sahoo et al. 2015). Distant locations, time of day, health, etc., were included within the measurement system. Similar behaviours are examined in the qualitative and quantitative study, and the routine nature with which these "stressors" were described in the qualitative study may reflect the ways in which difficult environmental conditions have become "normal" for women within our study population.

Women's general silence subjects such as harassment and sexual violence (a taboo subject) in GDs stood in stark contrast with women showing very high levels of social and sexual-violence stressors in surveys. Women may have been reluctant to discuss personal experiences of harassment and violence in GDs and more comfortable sharing personal experiences in the more private survey setting. In GDs, women were first asked to comment on their experiences with the everyday of open defecation, urination and MHM (i.e., environmental stressors). Inconveniences caused during monsoons and floods (environmental stressors) were expressed by women across age groups. Without direct probing women and girls may have been reluctant to share more disturbing, out-of-the-ordinary experiences. Survey

questions elicited responses that made it easy for women to answer questions about social stressors and fears about sexual or gender-based violence in a straightforward manner. This demonstrates how survey methods, intelligently informed through qualitative inquiry, can collect key experiential aspects of sanitation that have significant impact on quality of life. Incorporating these experiential questions into the standard indicators for measuring sanitation interventions' success and failure, especially along gendered lines, could provide necessary data on the impact of programs on women and girls currently missing through standard indicator reporting alone.

Both qualitative and quantitative findings helped understand the various factors that are associated with SRPS. Sanitation-related stress differed across the life course in both the qualitative and quantitative studies. Responses from women at different stages of life showed the different perceptions of stress associated to poor sanitation. Middle-aged women spoke of fear of animals and insects. Girls on the other hand expressed shame and shyness at sharing facilities with men/boys at school or having to be around them when the need to use the school toilet arose. Mothers expressed a desire for a toilet due to pubescent daughters, and these fears seem to have been transferred to girls who spoke of general fears of being attacked. Girls could not remember (or chose not to tell) stories of sexual violence; often fears were spoken of as fear of ghosts. In the quantitative survey, married women reported the highest levels of SRPS and the highest levels of sexual violence stressors – considerably higher than adolescent girls. This may been a generational difference – younger girls may not view teasing and harassment by men with the same level of fear or anxiety that older or married women do. Additionally, among tight-knit communities young girls may be seen as the 'daughters' of all families, and therefore are not targets for teasing and harassment. While caste bias in rural Uttar Pradesh is well-founded in the literature (Coffey et al. 2015) and was spoken of by women in the qualitative portion of the study, the survey instrument did not find significant relationships between caste groups relative to the SRPS scores.

Of note, having access to – and using – a sanitation facility significantly reduced sanitation-related psychosocial stress. Women who reported access to a toilet facility were significantly more likely to report a lower SRPS summary score than those who did not report access to a toilet facility. Among those women who did have access to a toilet facility, reporting using that facility for urination or defecation was significantly associated with a lower SRPS summary score compared to those who did not report using the facility for urination (S $p<0.001$) or defecation (S $p=0.001$), indicating that having a designated location for urinating and defecating may significantly lower psychosocial stress. It suggests that despite the daily nature of urination and defecation, and women's habit of using a general OD location, women's stress is negatively impacted by this 'normalised' behaviour, compared to latrine usage.

However, we note that many women had facilities that were not used and having a sanitation facility did not entirely eliminate sanitation-related stress. Although villages had all participated in various sanitation schemes, few toilets that were built were usable and met the need of women and girls – over three fourths of respondents with a functioning latrine still practiced open defecation at least one in the week prior to data collection. In the qualitative portion, we found that the majority of latrines that had been built in villages as part of various sanitation schemes were primarily for show and that adoption of

a latrine was more closely a function of the need to provide facilities for a specific member of the household. Women and girls, therefore, used facilities less than the numbers of units would imply. Multiple studies in India have identified low-rates of use following sanitation interventions (Patil et al. 2015; Clasen et al. 2014). Findings from this study help explain why usage rates remain low – few toilets that were constructed under guidelines were considered complete, women and girls were not involved in the planning and placement of facilities, and facilities did not meet user needs.

Our study highlights the high prevalence and degree to which women regulate their behaviours and even their body functions to accommodate inadequate sanitation facilities. Adjustments necessary to go out in a group or wait to be accompanied (in the case of young girls), were taken as given. Rising early in the morning, or waiting to go after dark in the evening were common, everyday occurrences—avoiding being seen by men was presented by women as the only socially acceptable choice for sanitation practices. Not being seen by anyone was desirable, and OD was 'hidden' by not carrying water and performing anal cleansing upon returning home. These behaviour modifications were integrated into their daily lives. Only with probing did women discuss that they disciplined their bodies to avoid shame, embarrassment or the need to stand up while defecating. These feelings were also presented as obvious, as were the behaviour modifications required to avoid them. The behavioural modification index indicated that 80% of women surveyed did modify their behaviour in some way. Women's SRPS summary scores were positively correlated with a behaviour modification of some kind, suggesting that everyday habits of adjusting their bodies to SRPS is common. In sum, women did not speak of bodily discipline as stressful in GDs and SSIs, but survey results indicate that body discipline was highly correlated with SRPS and more modifications were made at higher stress levels. Importantly, access to a toilet seems to have reduced women's behaviour regulation.

Conclusions

This research shows that women feel measurable amounts of SRPS, and that those stressors can be mitigated by access to an adequate sanitation facility. Standard indicators for sanitation programming success have focused on the presence and use of facilities. Our findings indicate that the experiential aspect of both open defecation and sanitation facility use should be considered in understanding the magnitude of impact limited sanitation access has on the lives of women and girls, as well as how a specific intervention has or has not improved the overall process of sanitation use.

The research also indicates that it is possible, and desirable, to incorporate questions related to women's SRPS into future studies of sanitation interested in the gendered impacts of sanitation interventions. It is well-known that open defecation causes loss of life, health, and impacts household economies. It is less understood the relationship between mental and physical stress, and their toll on the body over time. As it is clear from this research that women experience SRPS as part of their everyday lives—so much a part of their existence that it is recognised as 'inconvenient' and not 'stressful'—and it is likely that this stress not only impacts their general well-being, but perhaps their physical health over the long-term (Sahoo et al. 2015; Hulland et al. 2015).

This study is informed by the earlier work of the SHARE research teams (Sahoo et al. 2015; Hulland et al. 2015), but takes this work forward by capturing: a) women's daily experiences of stress that they may

not interpret as such, e.g., bodily discipline; b) the everyday activities associated with urination, defecation and MHM that represent the full spectrum of women's experiences that might lead to SRPS; c) a framework that enables survey questions such as those developed here that, informed by situated knowledge gained ethnographically, could contribute to standard indicators of the relationship of SRPS on women who do not have access to adequate sanitation, and what sanitation provision might alleviate in terms of women's SRPS. Gendered SRPS is understudied, but an important part of sanitation provision and usage, and perhaps an entry for greater participation of women in the sanitation planning and implementation processes.

Policy Recommendations

As a part of impact evaluations and cost-benefit analyses, measures of women's SRPS at baseline and endline are a critical part of measuring the impact that sanitation is having on the lives of rural Indian women. SBM is interested in building toilets for all and initiating behaviour change that will bring about usage. This research shows that the Sustainable Development Goals (SDGs) and the WHO-JMP (World Health Organization-Joint Monitoring Programme) could incorporate measures of women and girls' SRPS and its relationship to gendered social norms in meaningful ways, leading to better interventions and better outcomes, both for latrine use sustainability, and community health.

SDGs #5 and #6 pertain to gender equality empowerment and total coverage of sanitation and water for all, respectively. Under #6, which states ensuring of sanitation and water for all by 2030, #6.2 states a target to: achieve access to adequate and equitable sanitation and hygiene for all; and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

The SBM Guidelines are also committed to equity and inclusion, and specifically focus on the questions of women, differently-abled people and other vulnerable populations. The stated intent of SDGs and the SBM allows for suggestions in terms of developing assessment criteria that are inclusive and gender-aware (Swachh Bharat Mission (Rural) Division 2015).

Our recommendations for SBM specifically fall under the following areas:

Monitoring and Evaluation

The broad framework for monitoring SBM is as follows:

- Whether adequate Information Education Communication/Interpersonal Communication/Triggering activities have been carried out for behaviour change
- Whether toilets have been constructed as reported;
- Whether constructed toilets are being used;
- Whether ODF in single communities and larger village clusters have been created

The guidelines state that “independent agencies shall take up such monitoring which shall conform to national and international requirements like the Joint Monitoring Programme (JMP)”. However, the JMP itself does not have gender-disaggregated data and does not focus on psychosocial well-being indicators. These will have to be included at all levels of monitoring.

The guidelines state that both annual and concurrent monitoring will need to be done by independent third parties and communities, respectively. This guideline needs greater detail, specifically, it must be ensured that 'independent third parties' include agencies/persons/organisations sensitive to issues of gender and social vulnerabilities. Representatives from women's movements and similar civil society organisations will need to participate in monitoring. Concurrent monitoring activities at the community level require defining what 'community' means (i.e., not taking 'community' for granted as all-inclusive or equal). For this reason, women's groups and other discriminated groups' participation is necessary for socially-inclusive monitoring activities.

We recommend that psychosocial health of women and other vulnerable populations needs to be included as an indicator for monitoring, and groups representing these interests be included in monitoring activities.

Verification of ODF

SBM has issued a set of guidelines for verification of ODF and these guidelines do not mention gender. ODF has been defined as the termination of the oral faecal transmission with no visible traces of faeces found in the open environment and safe options for disposal. Currently, ODF verification—both the household survey tool and community survey tool—does not include gender or the impacts of sanitation/lack of sanitation on women's lives. However, Indian states have the freedom to include different indicators.

We recommend that these ODF verification questionnaires be modified to include specific questions on the psychosocial well-being of women and other vulnerable groups.

Disbursement linked indicators-World Bank support to SBM

The World Bank has provided USD 1.5 billion to support SBM by rewarding Indian states for their performance in meeting SBM targets. State performance is measured by disbursement-linked Indicators (DLIs). These indicators are: reduction in the prevalence of open defecation; sustaining ODF status in villages; and increasing the percentage of rural populations served by solid and liquid waste management. The DLIs have no gender component whatsoever (Government of India 2016).

The DLIs should be used as a powerful incentive to motivate sanitation programming that incorporates women and vulnerable groups' psychosocial well-being into state-level goals for attaining and sustaining ODF status.

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