

If you build it will they come? Factors influencing rural primary pupils' urination and defecation practices at school in western Kenya

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ABSTRACT

There is a need for a more comprehensive understanding of sanitation behaviors and determinants in the school setting to mitigate health risks, improve sanitation practices and programs, and maximize educational and health impacts. We conducted qualitative research with pupils and teachers in western Kenya to understand where pupils urinate and defecate and what factors influence location selection. Despite the availability of gender-separated latrines at all schools, pupils listed numerous locations for urination and defecation. Several physical environmental, social, and individual factors influence pupils' selection of where to urinate and defecate. Physical environment factors include condition, safety, privacy, accessibility, and availability of facilities; social factors include norms, expectations, and responsibility; and individual factors include experience, routine, risk perception, and personal needs. Students simultaneously weigh several competing factors to determine where to go. The factors that facilitate or hinder latrine use need to be taken into consideration during design, construction, operation and maintenance, if healthy habits are to be formed and sustained.

Key words | behavior, Kenya, menstrual hygiene management, school sanitation

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INTRODUCTION

School water, sanitation and hygiene (WASH) have been increasingly prioritized globally, recently evidenced by the inclusion of school WASH targets and indicators in proposals for post-Millennium Development Goal monitoring by the Joint Monitoring Programme (JMP) for Water Supply and Sanitation (JMP 2013). WASH interventions in schools have been associated with a range of education and health impacts (Jasper *et al.* 2012), including: increased enrollment and enrollment parity (Garn *et al.* 2013), and reductions in

absenteeism (Bowen *et al.* 2007; O'Reilly *et al.* 2008; Blanton *et al.* 2010; Talaat *et al.* 2011; Freeman *et al.* 2012), diarrhea (Freeman *et al.* 2013a), and helminth infection (Freeman *et al.* 2013b). While the evidence-base for school WASH programming continues to support global efforts, student reports of their own behaviors and perspectives of WASH programs and conditions remain absent.

Behavior change programs need to be a part of WASH programs to ensure effective and safe use of facilities. As

investments and prioritization of WASH infrastructure in schools increases, it is imperative to understand if positive attitudes and expected behaviors accompany infrastructure improvements. A child's first encounter with WASH technologies – like sanitation facilities and handwashing stations – may be at school, not at home, and students may require specific guidance for proper use. Further, children may bring their behaviors home and introduce positive WASH behaviors to other household members (Onyango-Ouma *et al.* 2005).

Positive sanitation behaviors are particularly important to promote in school given the health risks associated with exposure to feces in the environment as a result of open defecation (Clasen *et al.* 2010).

Few studies, however, have investigated determinants of sanitation behaviors of pupils, and the limited number have focused primarily on the link between physical characteristics of facilities and use. Toilet avoidance has been linked to poor conditions and strong odor in the United Kingdom and Sweden (Vernon *et al.* 2003; Lundblad & Hellstrom 2005). An investigation of behaviors among multi-ethnic, north Vietnamese schoolchildren found that children preferred to urinate and defecate in the open and that poor conditions, smell, and overcrowding deterred facility use (Xuan *et al.* 2012). In Eastern Europe, the Caucasus and Central Asia, unhygienic conditions, lack of privacy, and distance from school deterred both students and teachers from using school facilities, which was tolerated by decreasing liquid intake (Samwel & Gabizon 2009). No studies have investigated determinants of primary school sanitation behaviors in the rural African context, though a cross-sectional study in Kenya found decreased probability of recent absence among children attending schools with higher quality and better maintained sanitation facilities (Dreibelbis *et al.* 2013).

There is a need for a more comprehensive understanding of sanitation behaviors and determinants in the school setting to mitigate health risks, improve sanitation practices and programs, and maximize educational and health impacts. Qualitative research in western Kenya was conducted with pupils and teachers to understand the range of locations where pupils urinate and defecate when at school, what locations they prefer, and what factors determine location selection.

Results from this study were used to inform a trial that evaluated interventions to increase latrine use and decrease absenteeism (See Caruso *et al.* 2014).

METHODS

Study setting

Qualitative data were collected in October 2009 from three primary schools involved in the 'Sustaining and scaling school water, sanitation, and hygiene plus community impact' project (SWASH+) led by CARE and evaluated by Emory University in Nyanza Province, Kenya (See Freeman *et al.* (2012) for a complete description of project interventions and evaluation design). All schools participated in a previous cluster randomized trial (CRT) assessing the health and educational impacts of school-based water, sanitation, and hygiene interventions in primary schools and were purposively selected to represent different sanitation environments. For the current study, School A was part of the control group in the previous CRT and was in the process of receiving hygiene promotion, water treatment and additional latrine facilities at the time of data collection though the new latrine facilities were not yet completed. The latrines pupils at School A had access to were characteristic of the sanitation infrastructure in much of rural Sub-Saharan Africa: limited in number and of poor quality, built several years prior and hastily repaired and maintained over the years. School B and School C were part of the intervention group in the same CRT and received hygiene promotion, water treatment and sanitation interventions two years prior. School B received mobilets (portable toilets) and School C received latrines constructed from cement.

Data collection

Activities were guided by a phenomenological research approach, which aims to understand and describe the subjective experience of research participants related to a specific phenomenon and how and why they have those experiences (Moustakas 1994; Creswell 2012). Specifically, activities were structured to allow pupils to share their experiences of urination and defecation at school and to describe factors that may have influenced those experiences.

Focus group discussions with free-listing and ranking

Two focus group discussions (FGDs) – one with girls and one with boys – took place in each of the three schools (six in total). Research assistants asked teachers in each school to select six girl pupils and six boy pupils in standards (grades) 6, 7 or 8 who they perceived to be willing to discuss urination and defecation openly in a group. Thirty-six total pupil participants were engaged in FGDs; they were in standards 6, 7 or 8 and ranged in age from 11 to 17.

FGDs started with a free-listing exercise. Participants were asked to name all the places that pupils of their gender went to urinate ('make a short call') and defecate ('make a long call'), even if they did not go to those places themselves. Each pupil then individually ranked the locations according to their own preference. A discussion was initiated based on the listing and ranking responses, which encouraged students to elaborate on the locations listed and to explain preferences.

In-depth interviews (IDIs) and latrine walks with pupils

Research assistants identified one girl pupil and one boy pupil from each FGD who they perceived would be comfortable talking one-on-one in a short IDI about urination and defecation. IDIs were conducted while the pupil led the local research assistant on a tour of the school's latrine facilities (six pupil participants in total). Pupils were asked to describe how they selected a latrine for urination or defecation and how they perceived current latrine conditions.

IDIs and latrine walks with teachers

In two of the schools, IDIs were carried out with the head teacher or health patron, a teacher involved in the school health club and engaged in water and sanitation issues (teacher not available in one school). Interviews began inside the school building with questions about typical urination and defecation behaviors of pupils in the school and teacher perceptions of latrine conditions. The interview then moved outside to the latrines where the teacher was asked again about latrine conditions, how conditions may impact use, and what – if any – action could be taken in response to observed conditions.

The sample sizes for these activities were small; however, samples were sufficient to reach 'saturation' – the point in

qualitative research when additional data collection generates no new information (Morse 1995). Saturation was determined after visits to three schools. Additional FGDs and IDIs may have produced new information eventually, but given the relative homogeneity in the school populations and the consistency of themes across schools, we are confident in the sample size achieved. A greater number of IDIs with teachers was desired, though the two participants shared common perceptions, which are reported here.

Discussions and interviews with pupils were conducted in Dholou, the local language. Interviews with teachers were conducted in English. All discussions and interviews were digitally recorded, transcribed verbatim and translated into English as needed. Trained, bilingual research assistants carried out all data collection, transcription, and translation activities. At each school, the head teacher signed an 'in loco parentis' form granting permission to speak with pupils. Pupils provided oral assent to participate before activities began. The Emory University Institutional Review Board and the Ethical Review Committee of the Great Lakes University of Kisumu provided ethical approval.

Data analysis

Analysis began as data were collected. After each school visit research assistants provided feedback about research activities. Additional lines of inquiry were added iteratively to subsequent activities in light of emergent themes and concepts, including questions in the final two schools about menstrual hygiene management.

Identification of urination and defecation locations and preferences

Free-lists of locations for urination and defecation were retrieved from FGD transcripts and pupil's preferred locations for urination and defecation were collated.

Determination of factors influencing urination and defecation behavior

All transcribed data were uploaded into MaxQDA version 10 to facilitate qualitative analysis. Following a phenomenological approach, the primary author read all transcripts and

highlighted ‘significant statements’ related to a broad theme called ‘influencing factors’. ‘Significant statements’ were then organized into ‘clusters of meaning’, or themes. Using the themes, two authors wrote memos of ‘textural description’ to describe experiences of participants, and memos of ‘structural descriptions’ to elaborate on the varying contexts surrounding those factors (Creswell 2012). The memos of ‘textural’ and ‘structural descriptions’ informed the results and conceptual framework presented.

RESULTS

Urination and defecation locations and preferences at school

Lists of all defecation and urination sites generated by FGD participants were organized into three categories: (1) ‘structured sites’ are those intended for urination or defecation and included latrines and urinals; (2) ‘non-structured sites on school grounds’ are sites not intended for urination or defecation but are within established school grounds and included behind the classroom, behind the latrine, by the fence, behind the trees/garden, and in the furrows; and (3) ‘non-structured sites off school grounds’ are sites that are not intended for urination or defecation and are outside established school grounds and included the field, farm, bush, plantation, and by the road.

Despite availability of gender-separated latrines (structured sites) at all schools, locations listed showed a high degree of diversity, both within and among schools. At School A – where new latrines were not yet constructed – no boy named the latrine as a location used for urination or defecation. Boys urinated and defecated in one of two non-structured sites on the school grounds: behind trees or ‘behind’ the existing latrine. Boys also reported defecating at a nearby sugar plantation. Girls at the same school used existing latrines for urination and defecation, but also listed several other sites both on and off of school grounds. At School B, girls listed latrines as well as a range of non-structured sites within and off school grounds for urination and defecation. In contrast, boys at School B listed only the latrine

for defecation and only the latrine or school fence for urination. At School C, girls urinated and defecated in or behind latrines and also urinated behind the classrooms. Boys at School C reported a range of sites, both on and off school grounds, for urinating and defecating that included school latrines for defecation and school latrines and school urinals for urination.

The majority of girls preferred latrines for both urination (83%) and defecation (89%) at school (Figure 1). We noted significant heterogeneity in preferred locations among boys. Boys preferred various unstructured sites on the school grounds for urination (44%) over school latrines (39%). For defecating at school, 67% of boys preferred latrines while 33% preferred locations outside of the school grounds (sugarcane or maize plantations). Boys who preferred sites other than school latrines were all from School A, where new facilities were not yet constructed.

Despite the range of locations identified by pupils for urination and defecation, teachers insisted that only latrines were used and only younger pupils would potentially use other locations.

‘Moderator (M): Do many pupils still use a location other than latrines for short calls.

Teacher (T): We don’t experience much of this though at times the pre-school usually splash urine on walls outside the latrines. They do this for fun but when they are guided they use the latrines well ...

M: How about the pupils using a location other than latrines when they go for long calls?

T: Never. Not in this school.

M: Are you sure?

T: Yes, I am’.

(IDI with Teacher, School B)

‘M: Do many of the students use a location other than latrines for short calls [urinating]?

T: No one. We insist they use latrines ... Maybe pre-school and some Standard [grade] 1 [...] they acquire this habit from home and carry it to school. Since at home they don’t have latrines’.

(IDI with Teacher, School A)

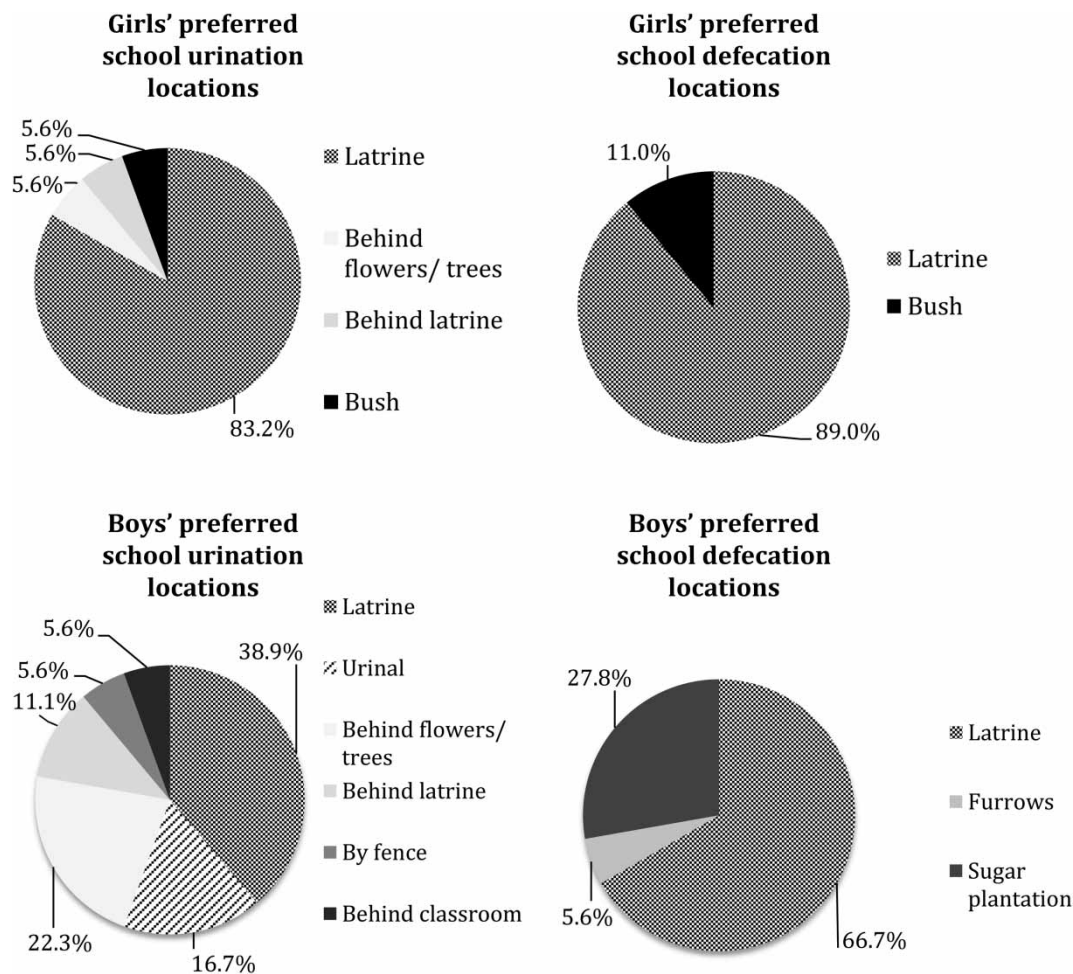


Figure 1 | Girls' and boys' preferred locations for defecation and urination among those who participated in the focus group discussions.

Factors influencing school site selection for urination and defecation

Several physical environment, social, and individual factors influenced pupils' selection of where to urinate and defecate, including why a location may be chosen or avoided.

Physical environment factors

Participants broadly described five dominant factors related to the physical environment that influence the location selected for urination and defecation when at school: conditions, safety, privacy, accessibility, and availability.

Conditions. Conditions of both the school latrines and other possible locations were the most frequently discussed factor influencing pupils' site selection; the majority of participants discussed the conditions of a location when describing factors that influenced the use of a specific site. Clean locations motivated use: 'When they are clean, then we are also very happy because we shall not panic when we want to go to the toilet. We shall be motivated just like my fellow had said' (Girl Pupil 3, age 15, grade 8, School B FGD).

Pupils were deterred from using a school latrine if the structure was compromised or if they found something repulsive inside a latrine, like urine, feces, blood, vomit, maggots, flies, a strong smell, or a full pit:

'M: What would make you decide not to use the latrine?

Pupil (P) 1: When the latrine is weak you fear that it can fall

P2: When the door is broken you fear that someone can see you ...

P3: When a lower primary pupil mess it up with diarrhea by not aiming at the hole well.

P4: When you find feces or blood from someone who is menstruating on the floor; it is so messy.

P5: Some nursery pupils do not know how to use the latrine. They just use it carelessly.

P6: When the latrine is not cleaned well, smells, full of flies so when you get in you come out with bad smell and yet you want to smell nice'.

(Girl Pupils, School C FGD)

'M: Can you please tell me of a time when you did not use the latrines at school?

P: It was when it rained so much and there was water all over. The latrines had water overflowing up to the door, and the maggots could be seen even outside the latrines. That is the time I did not use the latrines because I fear those maggots'.

(Girl Pupil, grade 8, age 16, School A IDI)

During latrine walks, teachers acknowledged that the latrines were dirty. Teachers attributed current conditions to several factors, including: a lack of resources to clean properly, an inadequate number of latrines to serve the population, and students not knowing how to use them properly.

'They [the latrines] are dirty because we don't have a proper way of cleaning, no disinfectants and hard brooms... Our latrines are few, and most pupils don't know how to use the latrines since they've not been trained on latrine use'.

(IDI with Teacher, School A)

Smell was a universal deterrent to use, both for structured and non-structured sites. Describing why he may not choose to defecate in the sugarcane plantation, a popular site, one boy explained: 'The smell which comes from that place when so many people have used it' (Boy Pupil 6, grade 8, age 15, School A FGD). One girl described a bad smell as triggering nausea, a feeling she would avoid by

simply not using a latrine and withholding: '... the smell that comes from the latrine. Some have urine on top, and some also have saliva spat all over the floor. So some times when you think of going to the latrine you decide to wait until you shall have gone home' (Girl Pupil, grade 6, age 12, School C IDI). Several participants also expressed a concern that the smell would adhere to them even after they left a location or that they could be responsible for others 'feeling' a bad smell.

Safety. Both girls and boys described physical safety of locations as a factor that influenced site selection. A participant from School A discussed her perception of the stability of the school latrine that influenced her avoidance: 'You know at this place, the soil is so weak such that during rainy season, sometimes the latrine sinks so you have to go to the bush' (Girl Pupil 4, grade 8, age 14, School A FGD). Participants were most likely to express concern for their safety when using non-structured sites compared to school latrines. In reference to the bush, farms, or other locations off school grounds, participants noted a fear of snakes that could bite them or being caught and beaten by someone: 'You know when you go to the bush you have to be afraid because you don't know what is next to you that might harm you' (Boy Pupil, grade 8, age 17, School B IDI).

Privacy. Privacy was an important factor for both boys and girls. In particular, doors and locks influenced pupils' sense of privacy and willingness to use facilities.

'When the door is broken you fear that someone can see you'.

(Girl Pupil 2, grade 6, age 13, School C FGD)

'I like it because you can close it securely when you are inside ... I just like using it because of the lock'.

(Boy Pupil, grade 6, age 13, School C IDI)

A boy from School A, where boys rarely used latrines, said that the added privacy of defecating off-site influenced his behavior: 'It is hidden so I can take time to enjoy the process' (Boy Pupil 6, grade 8, age 15, School A FGD). Conversely, a boy from the same school indicated that not having a private place could cause embarrassment: '...you can be very embarrassed ... somebody might find you there

and they can say that so and so is bad mannered' (Boy Pupil, grade 6, age 15, School A IDI).

For several girls, privacy was not only about being hidden from view; it prevented *other* students from making assumptions about their activities in the latrine:

P6: You can do whatever you want inside there without someone knowing.

M: Something like what?

P6: You can even change your pads without someone knowing that you were on periods'.

(Girl Pupil 6, grade 7, age 15, School B FGD)

Accessibility. Participants often discussed accessibility – how close or easy it was to enter or reach a space – as a factor influencing use: 'We decide to use the latrines because here at school they are nearer than the sugarcane plantations or bushes. So we do not waste time for our lessons. It also benefits us a lot' (Girl Pupil 3, grade 8, age 15, School B FGD).

Barriers to access exist, even when latrines are the preferred locations for urination and defecation: 'Sometimes when you come very early in the morning you find the latrines are locked and you do not have somewhere to go to' (Girl Pupil 1, grade 8, age 16, School B FGD). Pupils also considered latrines inaccessible if lines were too long or if they were far and pupils felt they did not have enough time to get to one and back before the end of a break. Without accessible facilities, alternatives may be sought out: 'Sometimes someone is using the latrine and you are so much pressed so you have to get an alternative' (Girl Pupil 1, grade 6, age 15, School A FGD). Boys and girls also indicated that locations are more or less accessible for use depending on their footwear.

M: Why have you chosen the fence [to urinate]?

P2: You can comfortably go there bare footed'.

(Boy Pupil 2, grade 6, age 14, School C FGD)

'When you don't have anything on and the latrines are dirty, you cannot go in with bare feet so you will just decide to use beside the latrine'.

(Girl Pupil 3, grade 8, age 15, School B FGD)

Availability. Whether or not a location was indicated as used by participants was related to whether or not it was

considered available for use. When asked why a student preferred the latrine at school but not at home, she replied 'At home we lack latrine but in school there is one' (Girl Pupil 3, grade 7, age 14, School C FGD). When latrines are not available, other spaces become acceptable because, as one pupil notes 'We do not have any other place we can go to' (Boy Pupil 6, grade 8, age 15, School A). Availability of a space also may be based on what alternative spaces are around and considered acceptable by the community. A girl in an FGD noted: 'Sugarcane plantations are so many so they are readily available and they are also meant for defecating' (Girl Pupil 4, grade 8, age 14, School A FGD).

Social factors

Social factors influencing behaviors included community norms and expectations, feelings of responsibility towards others, and perception of judgment. For norms, students used various social cues to understand what locations they could or should use. Social cues were learned through observation, or by being taught explicit rules and what behaviors were punishable.

M: At school most of you said that latrines are the best for short calls and at home you said that behind the houses are the best. Is there any difference?

P4: At school we have rules that we follow but at home we do not have such rules'.

(Girl Pupil 4, grade 7, age 14, School B FGD)

'Some of our parents also urinate at the fence so we also copy what they do'.

(Girl Pupil 5, grade 8, age 14, School C FGD)

M: What deters you from going for a long call in a bush?

P3: Can be caught and beaten by bush owners'.

(Boy Pupil 3, grade 6, age 11 School B FGD)

Many participants felt responsibility for other's health, the condition of the school environment, or for being a model to others. They did not want to be judged negatively for their behaviors:

M: How do you feel when you go to the bush?

P: You know when you are young you don't feel anything. But when you are old enough then it is not good

to go to the bush, because you can spread diseases ... You can infect people with diseases if you don't use latrines. When there is a lot of rain like now and people use water that is mixed with feces to wash plates, you know they can be infected'.

(Girl Pupil, grade 6, age 12, School C IDI)

'We cannot go beside the latrines for long calls because when children from the lower classes, including nursery, see you then they might also copy what you are doing. It means you are going to teach them your bad behavior and this is not good'.

(Girl Pupil 6, grade 7, age 15, School B FGD)

'When we go to the latrine we keep our environment clean. But when you go beside the latrine and visitors come ... then you can even conclude that our school is a very messy school'.

(Girl Pupil 1, grade 8, age 16, School B FGD)

Individual factors

Individual factors that influence site selection included: experience, routine, perception of risk, and personal needs. Both teachers and pupils commented that younger students were most likely to use spaces other than the latrines and they were also the most likely to create a 'mess' inside latrines because they did not have experience using them. For many young pupils, their first experience with a latrine was at school:

'M: Are there some pupils who use the bush for long calls?

T: [Laughs]. Still the pre-school and lower primary, that is, standard 1 and 2. Like I said, they acquire this habit from home and carry it to school. Since at home they don't have latrines ... A good example is that here in school most pupils don't aim at the holes while defecating since most of them use bushes at home'.

(IDI with Teacher, School A)

Routine was important for pupils when deciding where to go:

'I used to go to those other latrines when I was in lower primary because they were meant for the lower classes. Now when I joined upper primary I could not leave them

because I was so much used to them. That's why I still like using them up to now'.

(Girl Pupil, grade 6, age 12, School C IDI)

While safety and privacy may be related to structural issues, the intensity or extent that locations are perceived to be safe or private could be very personal. Many participants described perceived safety and privacy risk (or lack of risk):

'Only the nursery pupils go to the field because they fear going to the latrines'.

(Girl Pupil 6, grade 8, age 15, School A FGD)

'Here in school, latrines are few and secondly you can find that a person does something in the urinal and seeing this makes you fear to contract diseases'.

(Boy Pupil 5, grade 7, age 14, School C FGD)

Boys discussing urinating by the flower garden did not feel their privacy was at risk by having other boys around: 'You cannot be embarrassed because it is only boys who use that place' (Boy Pupil 1, grade 7, age 15, School A FGD).

Finally, personal needs can influence site selection. Specifically, girls who were menstruating indicated that the latrine could help maintain their privacy because they and their actions could not be seen:

'Latrine is the best because after you have removed the pad then you can throw it inside the hole'.

(Girl Pupil 4, grade 8, age 14, School C FGD)

'P1: When you are inside the latrine nobody will know what you are doing so they will not suspect that you are in periods.

P3: It is good because when you want to throw your used pads you just do it in the same place. You don't need to carry your soiled pad to a different place.

P4: It is the best place because it is hidden and very convenient'.

(Girl Pupil 1, grade 8, age 16; Girl Pupil 3, grade 8, age 15; Girl Pupil 4, grade 7, age 14; School B FGD)

DISCUSSION

Despite the presence of latrines at all study schools, several locations were used for urination and defecation at school.

Preferences varied depending on gender and whether or not the pupil intended to urinate or defecate. Managing menstruation also informed location selection for girls. Students in School A, which had the oldest and most dilapidated facilities, actively preferred to use sites other than school facilities. Teachers did not acknowledge that older pupils would use sites other than latrines, an indication that they were not aware of pupil behaviors or did not feel comfortable admitting what behaviors were truly being practiced.

Poor conditions, including the presence of feces, urine, blood, vomit, flies, maggots, and smell, were the most commonly discussed barriers to latrine use. Smell has been reported as a barrier to facility use among schoolchildren in Sweden (Lundblad & Hellstrom 2005), Senegal (Sidibe & Curtis 2007), and Vietnam (Xuan *et al.* 2012). Rheinlander *et al.* (2013) make a plea for practitioners to give serious attention to smell as a barrier to sanitation and to consider smell throughout the design, construction, and maintenance of sanitation facilities. However, our data show that smell is but one aspect of disgust that students feel toward latrines and more attention should be paid to all of the conditions that students themselves find disgusting, in addition to smell: flies, maggots, overflowing pits, vomit, urine, and feces. Disgust – whether sight or smell – may be an adaptation to prevent individuals from exposing themselves to environments that may be infectious or pose risk (Curtis *et al.* 2004). Disgust has been used to motivate handwashing (Curtis *et al.* 2011) and to encourage latrine construction and use by drawing attention to fecal matter in the environment as part of Community Led Total Sanitation (CLTS) efforts (Kar *et al.* 2008). However, our data demonstrate that disgust can be experienced in reaction to latrines themselves and CLTS and other promotional strategies need to fully consider the balance between triggering disgust towards open defecation and reducing the disgust-inducing elements in latrines. The inclusion of latrine cleanliness in open defecation free verification protocols for CLTS projects is an important first step in this process (Government of Kenya [GOK] *et al.* 2011), but strategies are needed to eliminate the conditions that can cause latrine-associated disgust in order to preserve student health and dignity.

Poor latrine conditions may undermine efforts to teach basic sanitation and hygiene behaviors in schools. Pupils without clean facilities lack a strong institutional example

and can be deprived of adequate opportunities to practice the knowledge they are taught (Jewkes & O'Connor 1990; Ebong 1994). Participants in our study clearly understood their role in keeping their environment clean to prevent disease. They spoke often about a sense of responsibility to their peers and the need to provide a strong example for others. Pupils expressed concern for their health due to exposure to unclean facilities smattered with feces and lack of access to footwear for protection. A refusal to use dirty latrines may be a health-positive behavior. Dirty school sanitation facilities may pose health risks for children due to pathogen exposure (Koopman 1978; Rajaratnam *et al.* 1992; Barnes & Maddocks 2002; Vernon *et al.* 2003). While not using latrines puts feces in the environment and may cause harm to others in the long term, not using a dirty latrine may be safer for the individual performing the behavior in the short term. Pupils struggle to balance the messages they are taught in school and the reality of the conditions of the facilities available to them. They simultaneously are informed of the health risks associated with fecal exposure and yet face punishment if they disobey rules and elect not to use a dirty, contaminated latrine. They are set up to make an impossible decision.

In response to findings in Vietnam that students would urinate and defecate in other locations despite having latrines on school grounds, Xuan *et al.* (2012) concluded that stakeholders need to work together to increase latrine use. Our data highlight the important role that latrine conditions play in determining use, suggesting that stakeholders must first ensure that facilities are suitable for use before intense efforts are made to encourage use. There are also limitations to what local stakeholders can accomplish without external support. In a controlled trial of multiple school-based interventions in western Kenya, Alexander *et al.* (2013) found that interventions, including organized roles and responsibilities for pupils, parents, and teachers, successfully increased the cleanliness of school latrines when coupled with small financial packages for participating schools. However, only those schools that received larger financial interventions and the option for external technical support were able to improve the quality of school structures, notably repairing or replacing doors on school latrines. While school organizations and school staff – including teachers – can help maintain facilities, making

larger improvements in the quality of the infrastructure is beyond their capacity (Alexander *et al.* 2013).

Children are key stakeholders in efforts to ensure adequate facilities are available at schools, and that they are clean and used. Children have been considered key participants in health promotion – both in the family (Christensen 2004) and at schools (Simovska 2004). Children are important ‘agents of change’, capable of influencing the behaviors of others via child-to-child (CtC), child-to-family, and child-to community approaches. While these approaches have merit, limitations exist. Research in western Kenya found that the impact of a CtC hygiene intervention was limited by factors outside of the student’s control, such as access to soap (Onyango-Ouma *et al.* 2005). Similarly, in the schools we visited, the conditions of latrines were outside of children’s control. While students are saddled with the responsibility of their behaviors, they lack an ability to build structures, make repairs, or purchase goods that would make expected behaviors feasible to perform.

While children have limited agency to change their school sanitation environment, they can control where to urinate or defecate. Children juggle several structural and environmental, social, and personal factors at a time to make the best possible decision (Figure 2). While we have presented these factors as distinct, many of these factors exert their influence simultaneously, and the need to urinate or defecate requires students to balance and prioritize often competing influences and messages. When asked about his decision-making process, one student indicated that several factors at once would influence his choice: ‘What would hinder me from using the latrines is when they are smelling and secondly when sometimes the pit is filled up and when I don’t have sandals and I want to go for short call’ (Boy Pupil 5, grade 7, age 14, School C FGD).

CONCLUSIONS

School latrines are underutilized due to numerous factors, which can undermine efforts to keep pathogens from the environment. Efforts need to be made to ensure that the factors that facilitate or hinder latrine use are taken into

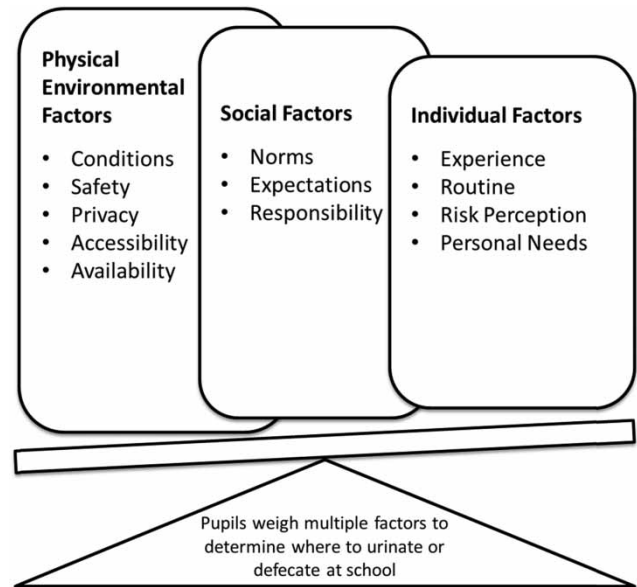


Figure 2 | Factors pupils in rural western Kenya consider when determining where to urinate or defecate at school.

consideration during design, construction, operation, and maintenance phases if healthy habits are to be formed and sustained. Without adequate infrastructure that suits pupils’ needs, they are not only deprived of adequate opportunities to practice the sanitation-related behaviors they are taught, but are also confronted with impossible choices that are harmful to their dignity and health. WASH practitioners should propose and evaluate interventions that make facilities more acceptable for use according to pupil standards.

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