Inappropriate flushing of menstrual sanitary products

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Abstract

This paper explores the disposal strategies of menstrual sanitary products through in-depth semi-structured interviews of women aged 18-30 years. There have been many educational campaigns to encourage solid stream waste disposal, however inappropriate disposal and blockages are still a major problem for the water industry. Whilst there have been quantitative studies exploring self-reporting of flushing norms, there is evidence to suggest these results may not take into account the complex set of socio-cultural factors associated with menstrual product disposal. Bridging this gap, our interviews found that although all participants had a desire to responsibly dispose, their ability to utilise solid waste streams or to minimise waste by using reusable products was not always possible because they felt, to some degree, restricted by the wider societal requirements for discretion and the design, accessibility and availability of bins and bathroom facilities. Based on these findings Industry recommendations are suggested.

Keywords

Waste management & disposal; Environment; Education & training.

1.0 Introduction

Blockages in wastewater networks from misuse can have a variety of negative impacts: flooding and pollution, inconvenience to households, high reactive management costs and fines to water companies. Around 80% of sewer flooding is due to blockages in wastewater networks, costing the industry around £88 million alone just to manage blockages (Water UK, 2017). One of the contributing factors to blockages is the disposal of female sanitary products (Post et al., 2015). Despite educational campaigns by water companies (Anglian Water, 2017), environmental groups (Women's Environmental Network, 2017) and manufacturers (EDANA, 2017), blockages and inappropriate disposal are still problematic.

Whilst there is good evidence of flushing behaviour from sewer surveys and quantitative data exploring self-reporting of flushing norms across a broad demographic (e.g. Friedler *et al*., 1996; Ashley *et al*., 2005; Dickens *et al*., 2012; Spence *et al*., 2016), there has been very little in-depth qualitative discussion with key stakeholders about the issue of menstrual sanitary product disposal in developed countries. In their study of sanitary waste disposal practices Ashley *et al*. (2005) identified hygiene and social embarrassment as factors influencing disposal of sanitary products and called for further research into this issue. Research into the menstrual management strategies of women and girls in low-income countries has been more widely researched, largely because the negative impacts are felt most acutely in these environments (Sommar and Sahin, 2013). It is argued here that menstrual sanitary product disposal practices are influenced by a complex set of socio-cultural factors that are not easily captured by self-completion questionnaires; and the findings of this study add a level of data enrichment to existing quantitative analysis that industry practitioners and researchers can utilise to better understand and thus influence future flushing practices. Based on these findings this paper therefore takes a more in-depth approach by providing an environment where these complex socio-cultural factors can be explored through semi structured interviews. Based on the findings of this research we suggest practical recommendations to the water, manufacturing and facility design industries.

2.0 Review of literature

2.1 Wastewater Blockages

The location and timing of blockages cannot currently be predicted, but they are more common in <225mm diameter pipes (Beattie & Brownbill, 2007) and can be several orders of magnitude more frequent in lateral connections than in main sewers (Post *et al*., 2015). Thus householders are exposed, in particular, to health hazards. The risk of blockages rises with mortared joints and vitreous clay pipes network system, proximity to highways and conditions that promote exposure to tree roots, pipe length and slope (e.g. Xie *et al*. 2016; Rodriguez *et al*., 2012). Snagging of solids may occur at

pipe joints and at rough sections of pipe wall or on obstructions due to poor sewer condition. Even if the risk caused by particular solids is currently uncertain, the cost of reactive and proactive maintenance encourages the reduction of inappropriate disposal practices as a precautionary measure.

2.2 Changing behaviour - structure and agency

A number of previous studies have sought to establish individual disposal practice and how to encourage disposal of sanitary products directly to the solid waste stream; reasons for poor flushing behaviour are cited as including a lack of knowledge about the primary function and capabilities of the sewer infrastructure and the adverse impact of releases into the environment, the habit and convenience of flushing, and the perceived 'flush-ability' of products (Dickens *et al*., 2012; Ashley *et al*., 2005; Le Masurier *et al*., 2015b) with women and girls dominating the groups identified as 'most susceptible to irresponsible flushing' behaviours(Le Masurier, *et al*. 2015a, p4). To encourage behavioural change, incentives have been evaluated and carefully designed and extensive educational campaigns to raise awareness of sewer misuse and consequent environmental impacts have been undertaken (see thinkbeforeyouflush.org, www.sas.org.uk, www.unitedutilities.com/services) . A focus upon motivating a positive change in individual behaviour also features heavily in environmental product design literature (Kuijer and Bakkar, 2015). Bhamra *et al.* (2011) explain that product and system design should encourage individuals to think about their use behaviour and take responsibility for their actions. However, it is recognised that attempts to affect meaningful change by targeting individual behaviour have limitations (Kuijer and Bakkur, 2015; Glasgow *et al.*, 2004). Ashley *et al*. (2002) acknowledge that 28% to 44% of women who flushed sanitary products claimed they would not be willing to stop doing so. Brandes and Kriwoken (2006; cited Brown and Farrelly 2009) also warn changing knowledge and perhaps behaviour through education programmes often overlooks the importance of understanding the pre-existing and broader barriers that limit the desired change in the first place. The failure of the 'bag-it and bin-it' campaign to significantly alter behaviour has been attributed a failure to recognise and anticipate reluctance of many women to draw attention to the use of the bathroom bin for the disposal of sensitive sanitary waste (Brown *et al,* 2006) Approaches that focus entirely upon the individual as the agent of change tends to neglect the need for change at other scales beyond the individual (Brynjarsdottir *et al*., 2012).

There have been many studies evaluating the effectiveness of education campaigns, and whilst there is evidence that marketing and education techniques can have short term impact upon behaviour, it has also been demonstrated that historical habits can re-emerge once a campaign ends, unless there have been concerted efforts to embed new habits and norms (Regar et al., 2000; Rimal, 2001; Kraemer & Mosler, 2012)

Within environmental behaviour theory a ‘value-action gap’ has been identified which demonstrates that some people who claim to hold green values, or have had their attitudes modified through educational campaigns, do not always manage to translate attitudes into action (Barr, 2006; DEFRA, 2005). There is some scepticism about approaches that focus exclusively upon nurturing good consumer behaviour; it is argued that it is impossible to talk only about individual choices or decisions

as they are deeply entrenched in social power structures (Southerton, 2013 Vihalemm, Keller & Kiisel, 2015). When considering something as complex and personal as managing menstruation, it is important to consider some of the complex social and cultural norms that are influencing what individual women feel is possible and acceptable in relation to sanitary product disposal. Understanding how individual agents interrelate with power structures is key if we are to design interventions that bring about meaningful change. Indeed it is acknowledged by Ashley et al. (2005, p208) that "social behaviour is the dominant factor and hence at the heart of any sustainability perspective for sanitary waste". Yet strategies to achieve favourable outcomes against both social and environmental indicators continue to focus upon attempts to change the attitudes, behaviour and choices of individuals - rather than, say, exploring how practices, such as the inappropriate disposal of sanitary solids via the wastewater system, have formed, stabilised, and become so damaging (Shove *et al*, 2012).

2.3 Menstrual taboo as a barrier to change

Practices relating to the disposal of sanitary products are also deeply connected to menstrual management strategies that are acknowledged to be shrouded in taboo and are developed in response to social pressures that call for discretion, cleanliness and secrecy (Newton, 2012; Pascoe, 2014). It is hard to find any academic literature that discusses the disposal of soiled sanitary products from the perspective of product users in high-income countries with developed water and solid waste infrastructures. The personal nature of this practice may be the reason why research into menstruation tends to be confined to anthropological and sociological journals. This work attempts to bring this taboo subject to the attention of the industry that is managing the technical impacts caused by product flushing in response to these perceived socio-cultural pressures.

Research into the impact of menstrual management of women and girls in low-income countries has highlighted poor access to appropriate facilities as one of the most significant barriers to women managing menses in a culturally appropriate and hygienic way. The facilities most lacking were toilets, water close to stalls for washing away blood and appropriate means for disposal of soiled products (Sommar & Sahin, 2013). Our work explores how women in a high-income country are also struggling (at times) to navigate the disposal systems provided for them, and the sources of information that are informing their behaviours.

3.0 Methods

Ten semi-structured interviews were held with women aged between 18-34 as this age range has been previously associated with higher rates of product flushing (Dickens et al., 2012). According to a campaign by An Táisce's Clean Coasts supported by Irish Water (see thinkbeforeyouflush.org), the frequency of sewer related littering was higher for younger age profiles (41% aged 18-24, 43% aged 25-34). Participants were recruited using a purposive snowballing method, with information sheets being circulated and participants contacting the lead researcher if they wanted to participate. Ethical approval for the study was obtained from the research ethics review panel at Sheffield Hallam University. In-depth semi-structured interviews represent a data gathering strategy that allows for

individualised interpretations of a broad theme, and creates an evolving and responsive data generation environment. Rather than responses to fixed questions, this method allows unexpected issues to emerge and become the focus of enquiry as an interview unfolds. This approach allows for the emergence of new problems that may not have been anticipated by the interviewer (Savin-Baden & Major, 2012).

Qualitative sample sizes are small but the volume of data generated by each participant is substantial and where the objectives of research seeks to produce emergent data, as opposed to confirming an existing hypothesis, data saturation (where no new codes are being identified in the data) can be reached quite quickly (Estrade et al., 2014). For this reason qualitative methods work especially well in conjunction with quantitative strategies, which provide robust quantifiable and measurable evidence of an issue - but do not always allow for the detailed interrogation of the nuanced causes of said issue (Yardley and Bishop, 2015). This is especially important when exploring subjects that are affected by socio-cultural issues such as modesty and taboo (Pascoe, 2014).

Interview data was professionally transcribed and then subjected to Interpretative Phenomenological Analysis (IPA). Developed in the fields of psychology and associated health professions, IPA allows for the personalised experiences of individuals to take precedent over the expectations or pre-conceptions of professionals and researchers, and is utilised when the research is looking to capture emerging issues from descriptive qualitative accounts of personal experiences or practices (Pringle et al., 2011).

Fisher's exact test was used to test for differences between disposal strategies of products; preferred disposal methods of sanitary pads *vs*. tampons (bin or flush) and preferred disposal methods in two disposal environments (bin in toilet cubicle, bin outside toilet cubicle).

4.0 Findings

4.1 Perceived flushability - To flush or not to flush?

Perceived flushability of a product is the main motivating factor given for the chosen disposal method. Research participants utilised a range of sanitary products to manage their menstruation. These included tampons, sanitary pads and liners, disposable wipes and reusable products such as washable pads and a latex menstrual cup. Research participants adopted a range of disposal strategies, and without exception, these strategies were highly contingent and contextualised. There was a significant difference between the disposal strategy preferred for sanitary pads and tampons (Fisher's Exact Test, two-tail, $p<0.01$). In certain places and situations, specific strategies were implemented.

4.1.1 Sanitary towels / pads / liners

The majority of participants who used sanitary pads and liners preferred to use a bin for the disposal of these products rather than flushing them (see Figure 1). Some expressed environmental

motivations for not flushing pads, but these were usually secondary to the fear of blocking and breaking the toilet. Most users of sanitary towels or liners did not think of the product as flushable. The rationale for this was predominantly a fear that flushing the pads would result in embarrassing blockages or that the product simply would not flush away even after repeated flushes. Even the participant who did flush towels was aware that it was difficult to get them to flush and that even they would not try this in certain low-flow toilets.

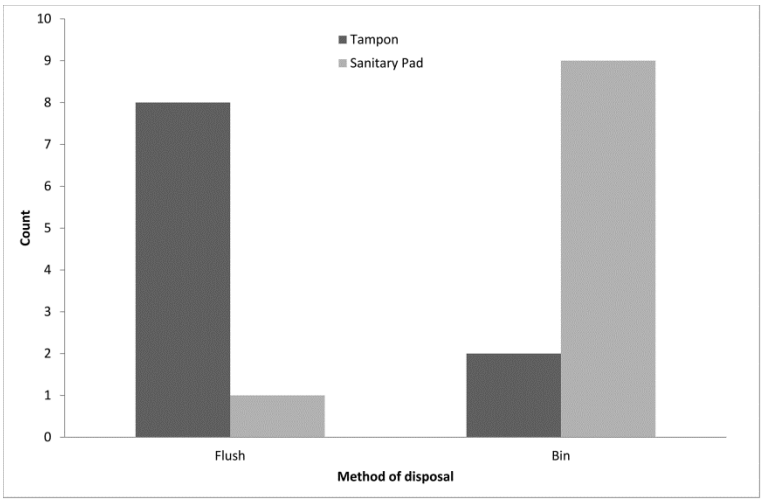

Figure 1. Disposal method preferred by respondents when using sanitary pads and tampons. Each respondent stated one preferred method for the disposal of sanitary pads and one preferred method for the disposal of tampons.

4.1.2. Tampons

In contrast to towels, the majority of tampon users believed that the product was flushable or had done so until relatively recently (see Figure 1). The reasons given for the perceived flushability of tampons included:

- The compact shape and material composition of the product suggested flushability.
- In practice, the product flushed away easily.
- The mechanics of removing used tampons make flushing the ‘easiest’ and most ‘hygienic’ option.

The reasons given for flushing tampons were more ambivalent and based upon ‘common sense’ assumptions about the product rather than anything they had been told. One participant only questioned this practice when her mother had a septic tank installed and made specific mention of not flushing tampons. There was some uncertainty about whether this practice was ‘correct’, but the majority of tampon users assumed that flushing was the right thing to do.

> *“I don’t know if it’s cos I see it as, not that I see a tampon as a natural product, but just the composition of a pad, it’s 'plasticy' whereas tampons are more cottony, I feel like tampons seem a bit more natural so therefore it’s a normal thing to put down the toilet than pads, but also it’s easier with a pad to wrap it up and put it in the bin than it is with a tampon.” (FS4)*

For some participants, flushing products is preferable, mainly because it is seen as cleaner and easier than having to handle soiled products or having them 'hanging around' in the bin at home.

> *[at home] it still tends to be flush it just because, say if you wrapped it up in the wrapper and put it in the bin, if someone comes in your room and it's just in the bin I can just feel a bit…embarrassed." (FS2)*

The majority of participants who used tampons flushed the used product but disposed of the applicator (when used) in the bin. There were some accounts of flushing the cardboard applicators because these were believed to decompose like toilet paper, but all users of plastic applicators disposed of these via the bin.

4.2. Factors influencing disposal habits and their change

4.2.1 Learnt behaviours

The two main sources of information about use and disposal of products were female family members, (typically mothers or older siblings or cousins) or the personal health talks given to girls in school when they are around 11 years old (see Figure 2). All of the participants followed the advice they had been given at the start of menstruation, with no one citing product packaging or information campaigns as a source of information about appropriate disposal.

> *"My parents must have told me not to do that, does it have instructions on there? I don't know how but I knew that you weren't supposed to do that, that sanitary towels go in the bin, I used to think tampons you can flush down the toilet but sanitary towels have to go in the bin." (FP2)*

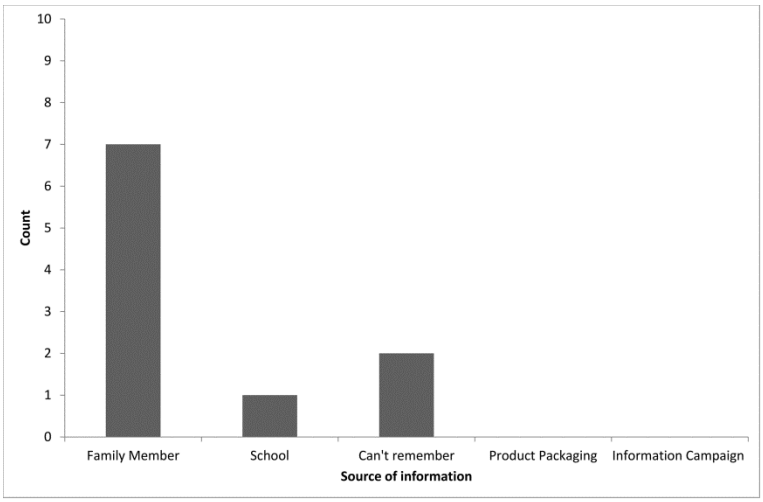

Figure 2. The main source of information about disposal of sanitary products for each participant. Each respondent named one source of information.

Sanitary pads were found to be the product offered to young girls when they start menstruating. Although they had been given clear instructions about how to dispose of sanitary pads and liners,

very few of the participants had been informed about using and disposing of tampons, as they often did not start using them until several years later.

4.2.2. Social barriers

None of the participants were deliberately trying to subvert proper disposal practices. In every story provided there was a complex but clear process of negotiation going on when facing the challenge of managing menstruation. Underlying many of the practical problems faced by women when managing menstruation is the issue of taboo and the need for discretion. The message from most participants is that they felt that men do not want or need to know about menstruation and this has an impact upon the use and disposal of products.

When discussing where these attitudes begin, many of the participants mentioned the fact that when females are given information about menstruation at school they are separated from their male classmates. One participant remembers how the males participated in an extra hour of sport whilst the females were taken into the school hall for a talk about periods and being told by the nurse that *"the boys don't need to know about this" (FA1).*

Some research participants felt comfortable discussing menstruation with male peers and family members, but many of the younger participants felt the need to shield males from everyday realities of menstruation or had experienced negative attitudes from men in their lives such as boyfriends and fathers.

> *"Yeah I wouldn't talk to my dad about it, he would die, he doesn't like to know." (FA1)*
> *"No, I think that's also partly my dad's not engaged in that sort of way, he's very traditionally masculine, not wanting to even talk about that or think about anything like that" (FP3)*

In some cases, this resulted in women not feeling comfortable using bins in certain bathrooms because they did not want a used product to be seen by men.

> *"I guess it would be shame, which is really wrong, but you wouldn't want to have things like that out and about that everyone could see would you really? I wouldn't be bothered at all if it was just girls but the thought of a lot of boys seeing it and their reactions I think would be shock and horror, it would be a bit embarrassing." (FS3)*

The need for discretion, however, also influenced disposal strategies in single-sex environments such as female public toilets. Where the sanitary bin was located in the communal hand-washing area many of the participants preferred to wrap the used product up and take it away in their bag rather than be seen disposing of a used product by other women (see Figure 3).

> *"It depends where I am I think. Say if I'm at Uni and there's the bins in every toilet, then I'll put it in the bin, but when they only put one outside at the sinks I'm just like, how are you*

meant to somehow discreetly walk out with this… even though everybody in there's a girl you're like it's not really anybody's business is it?" (FS2)

The presence of menstrual blood on a used product was, for the majority of participants, a challenging reality that they managed in a number of ways. Almost all participants were highly conscious of the visibility of blood on either a used product or their hands and would go to great lengths to avoid either being seen in a public setting.

"I think it is that it's so inherent to think that anything that comes out of us is disgusting that we don't want to admit that we do it. (FA1)

"It's like when you [go to the toilet] you flush it away, it's gone, you can't see it, and you have to leave something quite… it's not disgusting, but if it sits there for a few days and you haven't changed your bin and there are six girls in the house, if you end up being on your periods together, there's a lot of mess. I don't like it. It makes the whole thing inconvenient when you're out you have to find a toilet and if it doesn't have a bin in it you're stuck and you have to carry it round with you and it's not pleasant". (FA1)

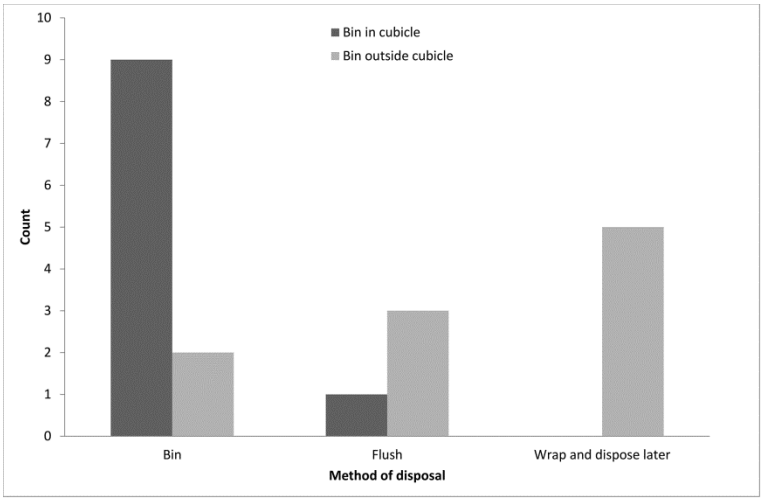

Figure 3. The preferred disposal strategy used according to the location of the sanitary disposal bin in public facilities. Each responded stated one preferred method for disposal when the bin was in the cubicle and one preferred method when the bin was outside the cubicle.

4.2.3. Impact of disposal environment and design of bathroom facilities

Whilst solid waste stream disposal was preferable for the majority of participants, their disposal strategies were highly contingent (see Figure 3). The location of the sanitary disposal bin in public facilities (inside or outside the cubicle) had a significant impact on the disposal strategy (Fisher's Exact Test, two-tail, $p<0.01$). The range of factors influencing the use of bins as a disposal strategy included:

- Always using dedicated sanitary bins in public facilities, but only when the bin was in the cubicle, not in the communal hand washing area.
- Only utilising bins in private bathrooms if that bin had a lid.
- Only utilising bins in private bathrooms that contained other women of menstruating age.
- Not utilising bins in mixed gender households.
- Only utilising sanitary bins in cubicles in public facilities, but flushing products at home.

The majority of sanitary pad users always used the bin as a disposal method. However, if the available bin did not meet their needs then they would wrap up the product in toilet paper or a spare sanitary pad wrapper and put it in their bag for later disposal.

> *"Usually, I don't know if it's gross, I just wrap them up and put them in my bag, a small pocket in my bag and then put them in the bin when I get home. I don't think his mum would be embarrassed but just the thought of it is a bit… cos she'd always know it was me." (FS3)*

Even though none of the participants wanted to carry soiled products with them, this was still preferable to using the bin if doing so compromised their need for discretion. One of the clearest examples of this issue can be seen in the reporting of disposal habits in public toilet facilities where the bins were either located in the cubicles, or outside of the cubicles.

The participants who used products such as washable pads and the reusable menstrual cup found these products worked in certain contexts, but all mentioned the incompatibility of reusable products and public toilet facilities with shared wash hand basins. Changing, storing, cleaning and using reusable products required more space and facilities than were available outside of the home.

As well as the location of sanitary disposal bins in public toilets, other issues with the design of facilities came up in interviews. For the majority of participants, the private bathroom environment gave them the facilities and privacy to manage their menstruation satisfactorily. Having to go into a public area, albeit single sex in the majority of cases, was problematic in terms of both disposing of products and washing hands. For participants who preferred to use reusable products, the space restrictions in public cubicles made changing and cleaning these products impossible so they tended to use disposable products when they were away from the home for a significant length of time.

A number of participants, when asked what other environments they found challenging when managing menstruation, mentioned attending music festivals. They identified a lack of sanitary disposal facilities in the toilets at music festival sites. The strategies adopted to deal with this ranged from carrying soiled products in a bag until a suitable bin could be found, or taking hormone medication to delay the onset of their period.

5.0 Conclusions and Recommendations

All participants in this study had a genuine desire for their sanitary product disposal strategies to cause as little harm as possible to both the environment and to the wastewater system and all recognised that flushing products would have a negative environmental impact. Nevertheless, their ability to utilise solid waste streams or to minimise waste by using reusable products was not always possible because they all felt, to some degree, restricted by the wider societal requirements for discretion and the design, accessibility and availability of bins and facilities. This was compounded by ambiguous knowledge of appropriate disposal requirements for products such as tampons.

5.1 Targeted information campaigns

Most women interviewed learned about product use and disposal at the point they started their periods and usually still followed the advice they were given by mothers, siblings or schools at this time. Very few girls at this age are told about tampons and so made assumptions about the disposal of this product. Tampons were widely believed to be flushable items and the socio-technical infrastructure for their disposal via solid waste streams is not yet in place. This therefore reflects the importance of education at appropriate ages and education focused on tampon disposal around the age of first use.

Recommendation: Disposal information for *all* (not just sanitary pads) sanitary products should be embedded in public health education about menstruation offered to children at school, and a targeted information campaign should be designed for parents and carers of young women so that appropriate and up to date information about product disposal is passed on from one generation to the next.

5.2 Design of Facilities

The design of public bathroom facilities does not always support solid waste stream disposal and may encourage products to be flushed. Some women are prepared to carry soiled sanitary products in their bag until a suitable bin can be found, but this is evidence of a system not working and it cannot be assumed that all women will be able or prepared to do this. Using bins in the home often means making menstruation ‘visible’ to a mixed gender household, and where this is considered unacceptable or undesirable, flushing products is a way of ensuring discretion.

Recommendation - Water companies work with facilities management departments, architects and product designers to devise products and bathroom facilities that will support solid waste stream disposal. This should recognise that women require bins to be located in cubicles as a minimum, and that a move to larger cubicles with integral hand washing facilities would further support women to manage their menstruation discreetly and hygienically and make it more likely that they would dispose of products such as tampons in a bin.

5.3 Framing menstrual taboo as a 'design problem'

It needs to be recognised that the existence of taboo has a tangible impact on the water industry, because it is the most common factor influencing the disposal strategies of these research

participants. If it could be inferred that women who volunteered to participate in the study did so because they were comfortable discussing this subject with a stranger, then this is a strong indication of a widespread issue, indeed this is comprehensively reinforced by existing research (Brown *et al*, 2006).

Recommendation: If women are reluctant to dispose of soiled products in domestic and public bins because they are worried about the perceptions of the other household members and visitors, then this disposal strategy is compromised. Therefore this issue needs to be considered when educational campaigns, bathroom facilities and sanitary products are being developed. Strategies that fail to acknowledge and account for this issue are likely to have limited impact and efforts to make managing menstruation less 'shameful' and hidden are likely to encourage more environmentally sustainable practices.

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Figure captions

Figure 1. Disposal method preferred by respondents when using sanitary pads and tampons. Each respondent stated one preferred method for the disposal of sanitary pads and one preferred method for the disposal of tampons.

Figure 2. The main source of information about disposal of sanitary products for each participant. Each respondent named one source of information.

Figure 3. The preferred disposal strategy used according to the location of the sanitary disposal bin in public facilities. Each responded stated one preferred method for disposal when the bin was in the cubicle and one preferred method when the bin was outside the cubicle.

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