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**39<sup>th</sup> WEDC International Conference, Kumasi, Ghana, 2016****ENSURING AVAILABILITY AND SUSTAINABLE MANAGEMENT  
OF WATER AND SANITATION FOR ALL****Behavioural factors for improved after-use cleaning habit  
of shared latrines in Kampala slums, Uganda***I. K. Tumwebaze & H-J. Mosler (Uganda)***REFEREED PAPER 2483**

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*Access to clean shared facilities fundamental to health and social well-being to millions of people living in urban slums in most developing countries. This study assessed behavioural factors (risks, attitudes, norms, ability and self-regulation) for improved after-use cleaning habit of shared latrines in Kampala slums. A before-and-after study was conducted between 2012 and 2013 in three slums in Kampala, in which shared latrine user's cleaning habit and the behavioural influencing factors were assessed. The findings after testing behavioural interventions consisting of discussions and commitment showed that there was an improvement in individuals' after-use shared latrine cleaning habit from in the discussions (Mean difference = 0.26) and discussions plus commitment (Mean difference = 0.35) compared to the control population (Mean difference = 0.17). The improvement in cleaning habit was through individuals' awareness of their vulnerability to getting diseases, involvement of latrine sharing families in cleaning, personal cleaning norm and commitment.*

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**Introduction**

Access to shared sanitation facilities in urban developing countries' urban slums are the most predominant but often pose a health risk to users due inadequate hygiene conditions (Tumwebaze et al., 2012, Mara et al., 2010, Buitendijk, 2008, Rahman et al., 2010, Heijnen et al., 2014). While behaviour change is fundamental to proper functioning and use of the sanitation facilities, not many studies have focussed on improving the cleanliness of shared facilities and mostly with the users taking a centre stage (Tumwebaze and Mosler, 2014b, Tumwebaze and Mosler, 2015). This study adapted the risks, attitudes, norms, ability and self-regulation (RANAS) model of behaviour change (Mosler, 2012) to understand the after-latrines-use cleaning behaviour of shared latrine users.

**Methodology**

The data analysed in this study is part of the large data collected in a before-versus after-intervention study on shared sanitation users' cleaning behaviour (Tumwebaze and Mosler, 2014a, Tumwebaze and Mosler, 2015). The study was conducted in three slums in Kampala (Kironde, Lufula and Mulago III), Uganda's capital city between 2012 and 2013. Kironde, Lufula and Mulago III had been selected because of being found with the most dirty sanitation facilities according to findings from a user-driven sanitation study that conducted in 2010 to assess the general sanitation situation in 50 randomly selected slums of Kampala (Tumwebaze et al., 2012). The findings led to a further detailed study to understand shared sanitation users' cleaning behaviours and their influencing factors (Tumwebaze and Mosler, 2014a). The behaviours assessed in this study included shared sanitation users' participation in cleaning (after-latrines use and collective cleaning – such as having cleaning days), habitual cleaning behaviour and cleaning intentions. Based on the findings from the before-intervention study, respondents with dirty geographically defined sanitation facilities were randomised into control (n=40), discussions-only (n=38) and discussion + public commitment (n=41) intervention. The shared sanitation users' in the control arm received no direct form of intervention while those in discussions-only received a one-point group meeting and for the discussion + public commitment it contained a one-point group meeting and making a public-written pledge to participate

in cleaning. Data for the before-versus after-intervention studies to evaluate after-latrine use cleaning was collected using household structured questionnaires administered by trained research assistants. Each of the discussions lasted between 30 minutes – 1 hour and were moderated by a local leader from the studied slum. The content of discussion was general to the way the facilities were used and maintained clean. The cleaning interventions (group discussions supplemented by a signed public commitment) were designed following the RANAS behaviour change techniques to positively alter shared sanitation users' risks, attitudes, norms abilities and self-regulation beliefs to improve their cleaning habits. The Implementation of the interventions was done with support from a local NGO (Sustainable Sanitation and Water Renewal Systems) and the local leaders and village health workers from each of the slums. The interventions lasted for three months and post-intervention survey conducted three months later. Data from 305 respondents that participated in the before-versus after-intervention study is reported. Discussions and commitment were tested in study as an approach to improve the performance of the RANAS factors on cleaning behaviour. The change in means is analysed for after-latrine-use cleaning habit and a linear regression is performed for the effect of RANAS factors on after-latrine-use cleaning habit.

## Results and discussion

Out of 305 respondents interviewed in the before-and-after intervention study, the majority (74.8%) were female and most of them (90.5%) were tenants. More than a third of the respondents (36.7% and 46.2%) had studied up to primary and secondary education level and only 8.9% tertiary while 8.2% had no formal education. The mean age of the respondents was 33 years (range 18-75 years) and the mean number of people living in respondents' households was about 4 persons (3.79) per household (range 1-10). Access to ventilated improved pit latrines was reported the most common type of sanitation facility (73.8%), followed by simple pit latrines (17%), pour flush (8.9%) and waterborne toilets (0.3%). The mean number of households using the sanitation facility was about 10 (9.81) households per stance and the mean number of people per sanitation facility stance (toilet/latrine room) was about 23 persons per stance (range 2-64).

With regard to shared sanitation users' cleaning behaviour, the results in Table 1 show that discussions and commitment had greater improvements in individuals' after-latrine-use cleaning habit compared to the control. Overall, shared sanitation users' cleaning habits increased significantly more at after-than before-intervention studies. As indicated by the change in means (T2-T1, which is the difference between the mean at post-intervention study minus the mean at before-intervention), shared sanitation users' after-latrine-use cleaning habits improved about 1.5 times more in the discussions than in the control interventions. This improvement is further strengthened when discussions are supplemented with a public commitment. The importance of discussions and public commitment in behaviour change promotion is evidenced in a number of previous studies (Lokhorst et al., 2013, Biran et al., 2014, Patil et al., 2014, Balliet, 2010). For example, community discussions and public commitment by local leaders have been reported fundamental for the successful implementation of community-led total sanitation approaches to end open defecation in most rural parts of the developing countries (Chambers, 2009, Patil et al., 2014).

Variable	Control				Discussions-only				Discussions + commitment			
	T1	T2	T2-T1	SD (T2-T1)	T1	T2	T2-T1	SD (T2-T1)	T1	T2	T2-T1	SD(T2-T1)
Cleaning habit	0.62	0.79	0.17	0.37	.55	.81	.26	.34	.45	.79	.35	0.37

Note: T1 = before intervention time-point. T2 = after intervention time-point. SD = standard deviation

The behavioural factors influencing slum dwellers' latrine cleaning habit after using a shared latrine is presented in Table 2.

RANAS factors	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	.126	.255		.494	.622	-.376	.627
<i>Risk factors</i>							
Disease vulnerability	.139	.051	.141	2.733	.007	.039	.239
Disease severity	.010	.007	.071	1.485	.139	-.003	.023
<i>Attitude factors</i>							
Affective feeling	-.019	.011	-.080	-1.765	.079	-.040	.002
Time cost	.007	.027	.011	.252	.801	-.046	.059
Cleaning effort	-.006	.047	-.005	-.120	.905	-.098	.087
<i>Norm factors</i>							
Cleaning families	.009	.004	.111	2.508	.013	.002	.017
Cleaning approval	-.004	.005	-.036	-.844	.399	-.014	.006
Cleaning obligation	.134	.014	.514	9.751	.000	.107	.161
<i>Ability factors</i>							
Cleaning ease	-.042	.040	-.049	-1.058	.291	-.120	.036
Cleaning roster	.008	.014	.028	.619	.537	-.018	.035
<i>Self-regulation factors</i>							
Cleaning routine	-.010	.014	-.034	-.727	.468	-.037	.017
Remembering to clean	.040	.012	.170	3.227	.001	.016	.064
Cleaning commitment	-.008	.029	-.013	-.279	.780	-.064	.048

Note: N = 119, R Square = .53

As shown in Table 2, individuals' after-latrine-use cleaning habit was influenced by their awareness of being vulnerable to contracting diseases if they used dirty facilities, cooperativeness of the other sharing families in cleaning, personal obligation to clean and remembering when to clean.

First, this study shows a statistically significant relationship between individual's after-latrine-use cleaning habit and the vulnerability to contract a disease. Shared sanitation users are more likely to regularly clean their facilities after use if they perceive themselves probable to contract diseases in case the facilities are left dirty. However, a number of studies have not found a statistically significant association between an individual's perceived vulnerability and their adoption or performance of a health behaviour (Contzen and Mosler, 2015, Sonogo and Mosler, 2014, Tumwebaze et al., 2014). Most risk interventions consist of health knowledge which is often known to the target population. In some studies, it is reported that information alone is not sufficient to influence people to adopt a health behaviour unless supplemented with other form of interventions (Biran et al., 2005).

Second, individuals are more likely to clean their sanitation facilities after latrine use if other user families are cooperative in their cleaning. An individual may decide not clean a sanitation facility if other user families are not cooperative (Tumwebaze and Mosler, 2014b, Tumwebaze and Mosler, 2014a).

Third, the more individuals perceived it as important to use a clean sanitation facility, the more they felt obliged (also referred to as personal norm in other studies) to clean their facilities after-latrine-use. Some studies report that people are more likely to adopt or practice a behaviour if they consider it important irrespective of others' involvement (Sonogo and Mosler, 2014, Dawes, 1980).

Lastly, this study found that individuals are more likely to engage in cleaning their sanitation facilities after use if they find it easier to remember. This finding contends with other studies where prompts were used as part of the interventions to improve behaviour uptake and performance (Contzen et al., 2015, Inauen and Mosler, 2013).

## Conclusion

This study has revealed that group discussions and commitment were important in improving shared sanitation users' after-latrine-use cleaning habits. It is important for practitioners to prioritize promotion of behaviours and interventions based on evidence-based research. This increases the performance of a behaviour and its likely sustainability.

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