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Influence of gender in toilet access on performance of shared sanitation facilities in slums: A case of Nanyuki slums, Kenya

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ABSTRACT

The Sustainable Development Goals agenda 6 emphasizes on sanitation access alongside gender equality as a transformative strategy to improved sanitation. However, although the need for safe sanitation is a well-recognized agenda, sanitation in slums has become a global challenge with noticeable gender disparities in access to and choices of safe sanitation facilities which could present non-proportional difficult gender-related sanitation choices in slums. With the serious health consequences of poor sanitation, it is essential to understand the gender-related factors associated with ability to access, utilize and maintain shared sanitation facilities in slums. This paper examined the influence of gender in toilet access, on performance of shared sanitation facilities in Nanyuki slums. The field research employed a convergent research design where simultaneous collection and analysis of quantitative and qualitative data was used. A sample of 98 participants calculated using Yamane's formula was used. The number of household heads per cluster was determined using proportionate-to-size formula Quantitative data was collected using structured questionnaires from household heads who were selected using cluster and simple random sampling techniques. The data was analyzed using the Statistical Package for Social Sciences (SPSS) version 26 in descriptive statistics and presented in frequencies, percentages, means and standard deviations and in inferential statistics like correlations and logistic regressions to unveil relationship between variables. Qualitative data was collected using focus group discussion guides from a purposively selected group consisting of women, men, landlords, Community Health Volunteers, a Public Health Officer and a sanitation representative. The data was analyzed in themes and presented in a narrative way. Findings revealed that females were the most users of shared toilets compared to men (Adjusted OR=1.14, 95% CI: 0.05-1.92, P=0.009<0.05) because they were left at their households due to commitments of carrying out household chores when men could use toilets in their places of work. Toilets were 0.76 times less acceptable and 0.75 less preferable for females than for males. Toilet location far from households, use of toilets at night for females, access to toilets with gapped super structures, unsafe and contaminated toilets significantly reduced the odds of toilet use (P<0.05). Adequacy of toilets (adjusted OR 4.95, 95% CI: 0.98-4.40, p= 0.032<0.05), and ability to meet user needs (adjusted OR 5.73, 95% CI: 0.70-4.15, p= <0.001) increased the chances of use of shared toilets. The odds for preference of toilets significantly increased by 4.95 and 2.09

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when toilets adequately addressed user needs and when they were separated by gender respectively ($p<0.05$). The study concluded that sanitation was among the critical issues that affected slum dwellers and its impact was disproportional to gender. The study recommended the need for provision of gender segregated data in sanitation service delivery, strengthening the role of women in leadership, the need for advocacy, community cohesion and gender mainstreaming in sanitation policies to promote gender-responsive sanitation facilities in slums.

Introduction

Access to safe sanitation is a fundamental human right and is critical for the prevention of diseases such as diarrhea, cholera, and typhoid, which are among the major causes of morbidities and mortalities in developing countries (*Demissie et al*., 2021). The Sustainable Development Goals agenda 6 emphasize on access to sanitation, alongside gender equality as a transformative strategy to improved sanitation (United Nations, 2015). When both men and women access sanitation facilities that adequately address their needs, sanitation conditions could improve. However, although the need for safe sanitation is a well-recognized agenda, a report by WHO/UNICEF (2021) showed that sanitation in urban slums has become a global challenge where residents have limited access and choices to safe sanitation facilities.Despite numerous attempts over the past to reduce the number of people lacking access to safe sanitation around the world, almost 3.6 billion people are still living without access to even basic sanitation facilities such as toilets or latrines (WHO/UNICEF, 2021). Given the serious health consequences of poor sanitation, understanding gender-related factors that influence ability to use safe sanitation facilities could be a critical concern for policy-makers and researchers around the world.

Shared sanitation facilities, which refer to toilets used by more than one household, have been thought as promising solutions to safe sanitation for residents in slums (*Simiyu et al*., 2017). However, influence of gender in toilets access, use and maintenance of the shared sanitations could be a complex yet a critical issue that intersects with broader concerns related to urbanization, sanitation and gender equality (Burt et al., 2016). Slum residents continue to access toilets which rarely address needs of all household members, are unsafe for use and poorly maintained. The gender-related barriers faced in accessing safe and hygienic sanitation facilities could have profound implications for the health, dignity and safety of the affected. Addressing these disparities call for concerted efforts at the community, policy and individual levels to create gender-sensitive and inclusive sanitation solutions which prioritize the needs of all residents, regardless of gender to promote access to safe sanitation (*Assefa et a*l., 2021). These efforts must not only advocate for gender parity but also promotion of gender transformative sanitation approaches along with inclusion to attain better sanitation services for communities.

Economic factors are critical in understanding gender disparities in access to toilets. Insufficient resources and inadequate infrastructure often lead to unsanitary toilet facilities, which have a disproportionate impact on women and girls. This issue is particularly prevalent in developing countries, where the absence of safe and private toilets in schools can hinder girls' education by causing them to miss school during their menstrual periods (Adhikari & Panda, 2017). However, despite the progress made in addressing these issues, significant gaps still exist. For example, a study by *Akpabio et al*. (2021) in Nigeria found out that while access to improved sanitation facilities has improved in many developing countries, women and girls still face significant barriers in accessing toilets. These barriers are particularly pronounced in rural areas, where households are more likely to lack access to safe and private toilets.

Gender in toilets access is a significant problem that impacts the health, safety, and dignity of women and girls. Cultural, social, and economic factors play a significant role in shaping gender in toilets access (Nagla, 2020). According to Ray et al. (2022) interventions such as the provision of gender-specific toilets and menstrual hygiene management facilities can help to address gender to toilets access and ensure that women and girls have access to safe and private sanitation facilities. Further research is needed to identify effective interventions to promote equitable access to toilets and to ensure that this basic human right is available to all. In addition to the factors discussed above, access to toilets can also be influenced by geographic location and infrastructure development. A study by Mukherjee and Sain (2019) found that access to toilets was significantly lower in

rural areas compared to urban areas in India, due to the lack of sanitation infrastructure and funding for toilet construction. This highlights the importance of considering the local context and infrastructure development in addressing gender disparities in access to toilets.

Moreover, the issue of access to toilets is not limited to developing countries. A study by Hawkins et al. (2019) found that women in the United Kingdom also face barriers in accessing safe and private toilets, particularly those who are homeless or living in poverty. These women often have to rely on shared toilets or facilities provided by charities, which may not be safe or clean. This highlights the need to address the issue of access to toilets in developed countries as well.

In terms of policy interventions, several studies have emphasized the importance of involving women and girls in the decision-making process for sanitation projects. A study by *Fisher et al.* (2021) found that involving women in the planning and design of toilet facilities led to more effective and sustainable solutions. This approach ensures that the facilities meet the specific needs of women and girls, and can help to break down cultural barriers that may prevent them from accessing toilets.

Education and awareness-raising programs can also play a crucial role in promoting equitable access to toilets. A study by Amin et al. (2020) found that providing education on menstrual hygiene management and addressing cultural norms surrounding menstruation can help to increase the use of toilets by women and girls. This approach can also help to reduce the stigma associated with menstruation, which can be a significant barrier to accessing toilets. In conclusion, gender in toilets access is a complex and multifaceted issue that requires a holistic approach. Cultural, social, economic, and infrastructure factors all play a role in shaping access to toilets, and effective interventions must address each of these factors (Nagla, 2020). Involving women and girls in the decision-making process, promoting education and awareness, and ensuring the availability of safe and private sanitation facilities are all critical steps towards promoting equitable access to toilets for all.

Existing studies for instance fail to point out in depth the aspects of toilet access of shared sanitation facilities and the sanitation crisis in relation to gender has not received the attention it deserves (*Assefa et al.*, 2021; Burt et al., 2016; Greed, 2019; Iqrar & Musavi, 2023; *Pommells et al.*, 2018; *Simiyu et al.*, 2017). Majority of studies overemphasize on access to water while these disparities in sanitation have not received equal attention. As well, according to *Assefa et al.* (2021), sanitation implementers and policy makers partially include a gender lens in the design and implementation of sanitation facilities. Failure to consider potential sanitation inequalities and gender differences could block achievement of universal sanitation access as envisioned in the Sustainable Development Goals (United Nations, 2015). It was therefore necessary to examine the influence of gender in toilet access on performance of shared sanitation facilities in slums for improved performance.

The growth of slums as a result of rapid urbanization in developing countries, Kenya included, has exacerbated poor sanitation in informal settlements where residents often grapple with inadequate access to basic sanitation services. Although shared sanitation facilities have been established in slums as solutions to enhance sanitation conditions, a glaring gender disparity persists in how the shared facilities are accessed, utilized and maintained within the slums. Women have been portrayed as victims who continually bear the burden of unsafe sanitation while using shared sanitation solutions in slums (*Simiyu et al.*, 2017) which could consequently affect their dignity, safety and self-esteem.

Women and girls face substantial barriers including access to toilets located in lonely places which create fear of harassment or sexual assaults (Cassidy, 2021), Privacy, dignity, ability to meet sanitation needs and proper maintenance in sanitation facilities is a priority to toilet users. However, the lack of separate toilets, access to unmaintained toilets and to sanitation facilities which hardly meet sanitation needs of users such as menstrual hygiene management, could discourage people from using shared toilets which could lead to unhygienic alternatives like open defecation. Defecation in the open could expose the slum population to sanitation-related diseases which are among the leading causes of children mortalities and morbidities in Sub-Saharan Africa (*Demissie et al.*, 2021).

Access of shared sanitation facilities in slums in relation to gender presents a multifaceted problem with numerous social and health implications (*Pommells et al*., 2018). Although gender disparities in relation to slum sanitation still persist, there exist limited documentation on its influence on performance of shared sanitation facilities in slums as most studies report on disparities in access to water (*Simiyu et al*., 2017). The essence of this study was to address such disparities in the sanitation sector.

Objective of The Study

The objective of the study was to examine the influence of gender in toilet access on performance of shared sanitation facilities in the slums areas.

Materials and Methods

Study Design

In this study the researchers employed a convergent mixed methods design, a comprehensive approach that combines both quantitative and qualitative data collection and analysis methods.

Study Site

The study was conducted in the slums of Nanyuki town in Laikipia County, Kenya this include Majengo, likii A, Likii B and Kanyoni. Laikipia County borders Samburu County to the north, to the south, Nyeri County, to the east, Isiolo County, and to the west, Nakuru County. The slums are characterized by overcrowded living conditions, limited access to basic amenities, and a diverse population facing significant socio-economic challenges. These slums exemplify the challenges residents face regarding sanitation facilities. The slums often lack proper sewage systems, facilities and clean water sources, leading to open defecation and the spread of waterborne diseases.

Target Population

This study targeted households within Nanyuki slums which have an approximate population of 26,148 people and 6,537 households (KNBS, 2019). Household heads from the four slums in Nanyuki were engaged to deliver precisely the household sanitation information as desired by the researchers. Further, the study targeted men, women, landlords, Community Healthy Volunteers, Sanitation representative and a Public Health Officer.

Sample Size Determination

It was essential that a representative sample be selected from an entire population representation. The total number of households in the study area was 6537 (KNBS, 2019). Since the study targeted household heads, the number of households, as opposed to the total population was considered in computing the sample size. The proportion of the population to participate in the study was calculated using Yamane's (1967) formula, as shown below:

$$n = N / (1 + N(e^2))$$

Where: n = sample size; N = population size ((households were targeted in this case); e = level of precision (the margin of error, taken as 0.1 for this study)

$$n = 6537 / (1 + 6537 (0.1^2)) = 98 \text{ households}$$

Sampling Technique

This study involved household heads who were selected from the households within the slums. The four slums in Nanyuki were considered as clusters. Proportionate-to-size simple random sampling technique was employed to select household heads from the households in each cluster. The method ensured that all participants, even though originating from unevenly distributed clusters, stand equal chances of being selected for participation. The distribution of samples in the slums is as shown in **Table 1**.

Cluster	Households	Sample per cluster
Likii A	1436	22
Likii B	859	13
Majengo	2110	31
Kanyoni	2132	32
Total	**6537**	**98**

Table 1: *Sample size distribution in Nanyuki slums*
Source: *KNBS (2019)*

Purposive sampling technique was also used in the selection of focus group discussion participants, three focus group discussions were held, one involving 2 women, 2 men, 2 landlords, 2 CHVs, 1 Public Health Officer and 1 sanitation representative. Another group was on 6 women as they were believed to be vulnerable to poor sanitation in slums (Kobia, Kirimi & Mbugua, 2022) and the third group engaged 6 men. Women and men were engaged in a

focus group discussion to express their encounters in relation to access, use and maintenance of sanitation facilities in slums. Landlords were involved in the study as they were the owners of the toilets and oversaw their establishment. On the other hand, Public health officers (PHOs) and Community Health Volunteers (CHVs) as well as a sanitation representative was involved in the study given their knowledge and experience with sanitation issues in the community. The basis for using separate groups for men and for women was to facilitate open discussions on sensitive sanitation matters which either gender could feel uncomfortable sharing in the presence of the other gender.

Data Collection

The study involved collection of both qualitative and quantitative data. For quantitative data collection, structured questionnaires were employed, featuring a range of closed-ended questions These questions were designed to gather numerical responses from participants, enabling statistical analysis, Conversely, qualitative data was gathered through open-ended focus group discussion guides from selected women, men, landlords, CHVs, Public Health Officer and a sanitation representative. Field notes and audio recordings were used to capture non-verbal cues and contextual information during the qualitative data collection process.

Data Analysis

Quantitative data gathered from households was analysed in descriptive statistics like percentages, frequencies, means and standard deviations and in inferential statistics using the Statistical Package for Social Sciences (SPSS) version 26 and results presented in tables, graphs and pie charts. For inferential statistics, logistic regression analysis was performed to show the relationship between dependent and independent variables. Qualitative data, which was gathered from the focus group discussions was analysed in themes and presented in form of narratives. The MAXQDA software was used for organization, coding and generation of themes from the findings.

Ethical Consideration

Approval to conduct research was sought from the Meru University after subjecting the study to ethical review process. A permit for data collection was obtained from the National Commission for Science, Technology and Innovation (NACOSTI). Informed consent was sought from participants. The participants were fully informed about the research's purpose, procedures, potential risks, and benefits, and requested to provide voluntary and informed consent before participating. Participant's personal information was safeguarded and data was anonymized to prevent any potential breach of privacy

Results and Discussion

Demographics

Female respondents were 52% while males were 48%. The findings implied that more females than male took part in the study. The results could be related to the fact that while men were busy at work to feed their families, women were left at home doing their usual household duties thus being the household heads at the time of the study. These findings concurred with the study by Kobia et al. (2022) in Meru slums which reported more females in the households as a result of commitments in carrying out household chores. Sanitation facilities at the household level therefore required to be gender-friendly so that the needs of the most frequent users of toilets were addressed.

Performance of Shared Sanitation Facilities

The study aimed at assessing the performance of shared toilets in slums in terms of toilet utilization, preference or acceptability and hygiene.

Toilet Utilization

Majority (77.6%) of participants reported that they had utilized shared toilets at the household level and 22.4% of the population used other options. It can be deduced from the findings that shared toilets were the predominant sanitation solutions in slums probably because of the challenges encountered in slums related to space and financial resources.

Similar findings were reported in Kenya where a study by Simiyu et al. (2020) reported that shared sanitation facilities were the most common options for slum residents because they cut the cost of adopting household toilets.

Use of shared toilets by gender

It was established that more females (47.6%) than males (20.4%) used shared sanitation facilities

which could be related to the fact that men mostly moved to work for their families and would use the toilets provided in the workplace during the day. However, for women who mostly resided in homesteads to perform household chores, they had no other sanitation option other than using the available shared sanitation facilities hence the higher number of women users.

Preference of Shared Toilets

Majority of the participants in the slums (74.5%) reported that they would not prefer to use shared sanitation facilities while only 25.5% of the population would prefer using the shared toilets. The findings implied that the preference for toilets which were shared was low for most of the slum residents. However, since the shared toilets were the predominant solutions in the slums, residents remained with no other choice of sanitation facilities which forced them to use them regardless of their status or avoid them for open feacal disposal such as use of flying toilets .

Preference of Shared Toilets by Gender

Findings indicated a significant variation in the preference to shared toilets by gender where 59 females indicated that they did not prefer the shared toilets compared to only 14 males. On the other hand, more males (20) reported preference to shared sanitation facilities compared to only 5 women who indicated that they would prefer using shared toilets. It was concluded from the results that women were less contented with using shared sanitation options in slums. In India, a similar study by O'reilly and Budds (2023) identified high reluctance to use shared toilets among the female gender compared to males.

Acceptability of Shared Sanitation Facilities in Slums

The researchers aimed at finding out the views of respondents on whether the available shared toilets were acceptable for use and whether they were actively being utilized. a five-point Likert scale was used, participant's statements shown in **Table 2**.

More than 50% of the respondents were of the contrary opinion. The mean recorded for the question was 2.43 (standard deviation=1.45) which implied that the available toilets in slums were not suitable for every slum dweller. As reported in the qualitative study, the toilets were less acceptable or suitable for use especially by women because they averagely addressed their menstruation and safety needs. The results suggested the need to have toilets in slums which could best address the menstruation and safety needs of women to ensure that they managed menstruation with utmost dignity.

As a follow up question to understand whether the views of women were considered when planning for sanitation interventions and solutions in slums, respondents were requested to rate women involvement. Results showed a very low mean of 1.92 (standard deviation=1.29) which suggested minimal women involvement in slum sanitation programming which could explain the reason why some slum toilets were unacceptable for use by some members. The minimal involvement of women in slums could be related to the issue of gender roles where decision making was the role of men. . Similar findings were noted in Bihar by Ashraf et al. (2022). Shared toilets had led to decreased open defecation cases in slums. At a mean of 3.84(standard deviation=1.24), the respondents agreed which denoted that open defecation cases in slums reduced as a result of presence of shared toilets in slums.

General Condition, Provisions and Status of Sanitation Facilities in the Slums

It was observed that almost half (48%) of the households in the slums shared a single toilet, 36.7% had two toilets for sharing while a few (14.3%) had more than two toilets. Majority of the toilets present in the slums (93.8%) were not separated by gender, 89.8% lacked menstrual hygiene management bins and many (66.3%) lacked hand washing facilities. Some of the toilets had hand washing facilities and 12.3% of such toilets had no water for hand hygiene management. Anal cleansing materials were not provided in 85.7% of the toilets, and 72.4% of the toilets had no materials for toilet cleaning.

Influence of Gender in Toilet Access

The study sought to establish how gender in toilet access influenced performance of shared sanitation facilities. The indicators assessed included access to a shared toilet, time of the day, toilet location, access to adequate toilets and access to toilets which addressed user needs.

Prompt	Mean	(SD)
Shared toilets are acceptable for use by all	2.43	(1.45)
Women are involved in decision making in sanitation	1.92	(1.29)
Shared toilets have led to decreased OD	3.84	(1.24)
The presence of shared toilets has increased the use of toilets	3.50	(1.53)

Table 2: *Acceptability of shared sanitation facilities in slums*

Access to Shared Sanitation Facilities

From the findings, more than ¾ of the residents accessed shared sanitation facilities in slums. The findings suggested that shared sanitation solutions were the common sanitation options in slums which agreed with the results obtained in Dhaka by Alam et al. (2017). The issues of limited space, finances and resources in informal settlements could explain the reason why it was more practical to ensure access to shared toilets in the slums compared to private toilets as confirmed by a study by lee (2023)

Toilet Distance from Home

58.2% of the residents accessed toilets located 10 meters or less, 35.7% had access to toilets located 10 to 30 meters away from households while 6.1% had access to toilets situated more than 30 meters away from households. The suggestion of the findings was that toilets for many residents were not too far to access. However, having some, although few, toilets located farther than 30 meters demonstrated that there were residents who accessed sanitation facilities far from where they resided. The study enquired whether the slum dwellers were comfortable with the distance for shared sanitation facilities. The results showed a mean of 3.57 (SD=1.59) implying that the majority of the residents in slums were comfortable with toilet distance from households. Location of toilets in a reasonable point from households limits fear of visiting toilets and could boost comfortability in accessing the toilets for all members.

Access to Adequate Toilets

mean of 2.94 (Standard deviation=1.74) on the statement concerning toilet adequacy was recorded which suggested that most of the respondents disagreed. The findings implied that residents deemed the shared toilets as inadequate for their sanitation needs. It was reported in the Focus Group Discussion that women were more affected by toilets insufficiency than men due to their anatomy and difference in sanitation needs for the genders. From the Focus Group Discussion, it was quoted that:

"Women have to always use toilets whether they need them for long call or short call because of the need to squat. Men could use urinals for short call and only visit the toilets for long calls. Do they even need to go to urinals every time? They can actually turn behind you or a lorry and be done, not like women."

These Findings demonstrated the need to ensure that adequate toilets were provided in slums to make conditions equally favorable for both men and women.

Access to Toilets Which Met Sanitation Needs

The resultant mean of responses was 2.83 (standard deviation=1.58). The findings implied that the available sanitation facilities did not meet the sanitation needs of majority of the slum residents.

Many women (30) compared to men (4) strongly rated their toilets as unable to meet their sanitation needs. Men rating was higher on the positive end with 17 strongly agreeing and 15 agreeing compared to 3 and 5 women for the same ratings respectively. The results unveiled the fact that the needs for women were not adequately addressed in the toilets which made women rate them as poor in meeting their needs. Men mostly required toilets for long calls and often used urinals for short calls and their positive response could be associated with their less needs in toilets.

Logistic Regression Analysis

The study used binary logistic regression to find out the relationship between indicators of the dependent variable and the independent variables. The

relationship between use, preference and acceptability of shared toilets with indicators of toilet access such as distance from home, time of day for toilet use, adequacy and ability to meet sanitation needs; indicators of choice to use toilets/usability like separation by gender, toilet privacy, safety concerns and queues and waiting time; and with indicators of toilet maintenance which included availability of toilet cleaning materials, floor condition, pit contents depth and cleaning roles was assessed. The results were presented in unadjusted (for the univariable analysis) and adjusted (for the multivariable analysis) odd ratios at 95% Confidence intervals.

Acceptability of Shared Sanitation Facilities

Regression analysis was also done to examine the likelihood of acceptability of shared sanitation facilities. The findings for both univariable and multivariable analyses were as shown in **Table 3** below.

The acceptance probability of shared toilets for females was 37% lower than for their counterparts (Unadjusted OR 0.63, 95% CI: 0.52-2.81, p= 0.003<0.05). In the unadjusted model (univariable) for the odds of toilet acceptability (Table 4.27), chances that toilets situated more than 30 meters away from households were acceptable were 26% lower than those situated <10 meters near households (TL) (Unadjusted OR 0.74, 95% CI: 1.32-2.99, p<0.001). Acceptability of toilets was 4.92 times higher for toilets which met user sanitation needs (MN) compared to those toilets which did not meet the needs of users (Unadjusted OR 4.92, 95% CI: 0.29-3.69, p= 0.002<0.05). As well, separation of toilets by gender (SG) appeared to increase the likelihood of toilet acceptability by 1.80 compared to when toilets were not separated by gender (Unadjusted OR 1.80, 95% CI: 0.24-3.96, p= 0.042<0.05). However, toilets with holes around the walls (Unadjusted OR 0.93, 95% CI: (1.42-2.80, p= 0.025<0.05) and the sanitation facilities which were deemed unsafe for use (UT) (Unadjusted OR 0.95, 95% CI: 0.24-3.96), p= 0.042<0.05) had minimal likelihood of being accepted than toilets that ensured user privacy and safety respectively. Accessing toilets with contaminated floors (UFS) and whose pit contents were higher than 1 meter showed reduced odds of acceptability (Unadjusted OR 0.71, 95% CI: 0.44-2.98, p= 0.450>0.05; Unadjusted OR 0.52, 95% CI: 1.52-3.76, p= 0.78>0.05 respectively) but the association was non-significant.

The multivariable analysis showing adjusted odd ratios for toilets acceptability revealed a significant relationship between toilet distance (adjusted OR 0.68, 95% CI:1.56-3.01, p= 0.045<0.05), ability to address sanitation needs (adjusted OR, 4.88, 95% CI: 0.23-3.63, p<0.001) and privacy (P) in toilets (adjusted OR 0.82, 95% CI: 1.23-2.63, p=0.011<0.05). Although toilet acceptability in the univariable model had a significant association with safety of toilets and separation of toilets by gender, the variables were statistically non-significant in the adjusted model (p=>0.05). All variables which appeared non-significant in the univariable model were also non-significant in the multivariable analysis.

The association between toilets acceptability and indicators of the independent variables can be substituted as in equation iii as follows:

$$yii=\beta o+ \beta i\, xi+\beta ii\, xii\ldots+e$$

Acceptability of toilets= *0.68+0.74 (TL) +4.88 (MN)+ 1.86 (SG) + 0.78 (UFS) + 0.82 (P)+ 0.86 (UT)+ 0.72 (PD) +e*

Based on the findings from the equation on acceptability of toilets, toilets which were located farther than 30 meters away from households were less acceptable due to safety issues especially for women. Toilets that less guaranteed privacy were disregarded because any toilet user would desire dignity in toilets. Similarly, failure to avail the necessary provisions required by both males and females in toilets facilitated reduced acceptance because facilities which did not address user needs were user unfriendly. For instance, failure to provide water for toilet cleaning could make the toilets remain dirty and unacceptable for residents especially women who were likely to be more concerned of toilets hygiene due to fear of acquiring Urino-genital infections.

Conclusion

The study assessed the performance of shared sanitation facilities in the slums and concluded that although sanitation was among the important issues, it was poor in the slums and its impact varied across gender. There existed gendered sanitation barriers in slums which affected performance of slum toilets. The findings suggested that gender-based

Variable	Toilet acceptability					
	Unadjusted ORs		Adjusted ORs			Constant
	(95% CI)	P-value	(95% CI)	P-value	S.E	(β_0)
Gender						
Female	0.63(0.52-2.81)	0.003	0.76 (0.64-2.78)	0.027	1.37	1.20
Toilets located 10-30 M from H/Hs	0.67 (1.02-2.89)	0.107	0.74 (1.76-2.96)	0.445	1.98	1.77
Toilets>30 meters from households	0.74 (1.32-2.99)	<0.001	0.68 (1.56-3.01)	0.045	1.28	0.70
Toilets that meet needs	4.92 (0.29-3.69)	0.002	4.88 (0.23-3.63)	<0.001	0.91	0.59
Toilet separation by gender	1.80 (0.24-3.96)	0.042	1.86 (0.14-3.80)	0.056	1.22	0.78
Urine and faeces stagnation on the floor	0.71 (0.44-2.98)	0.450	0.78 (0.42-3.01)	0.893	1.43	0.45
Toilets with holed walls	0.93 (1.42-2.80)	0.025	0.82 (1.23-2.63)	0.011	1.15	0.33
Access to unsafe toilets	0.95 (0.24-3.96)	0.042	0.86 (0.34-3.89)	0.096	1.04	0.76
Toilets with pit contents >1M high	0.52 (1.52-3.76)	0.787	0.72 (0.99-3.78)	0.865	0.52	0.66

Table 3: *Odds of shared toilets acceptability in Nanyuki slums (n=98)*

complex issues came into play to affect the choice to use toilets, access and maintenance of the toilets in slums.

The study concluded that there was unequitable access to sanitation for women compared to men in slums due to gender differences in needs. Females were the most users of shared toilets and their acceptance to toilets was subject to toilet adequacy and their ability to meet users' needs. The toilets in slums needed to be located near households for easy usability by males and females both at night and during the day, to guarantee users' privacy and be adequately maintained for increased acceptance, preference and use.

Recommendations and Future Studies

Given the poor sanitation status and poor performance of shared toilets in slums, the National Government and County Water and Sanitation Ministries should put more emphasis on provision of data on sanitation service delivery which is separated by gender to avail transparent statistics which could inform appropriate interventions. This could help sanitation providers to understand gender specific needs and concerns related to hygiene and sanitation for appropriate actions to address poor sanitation in slums.

To improve access to toilets, sanitation programmers in slums should appreciate the contribution of gender in sanitation and the gender-related aspects that could constrain residents from accessing or using sanitation facilities. The role of advocacy and community cohesion to ensure that their needs are adequately addressed is essential. In addition, the Ministry of Water, Sanitation and Irrigation should embrace gender mainstreaming as a way of empowering women to have strategic choices in relation to services which accommodate the uniqueness of their needs to promote a healthier population.

There is need for future studies which focus on common gender differences in relation to sanitation to enhance development of policies capable of propelling sustainable access to gender-responsive sanitation solutions in slums.

Competing interests

The authors declare that there are no competing interests.

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