AFRICAN JOURNAL OF SCIENCE, TECHNOLOGY AND SOCIAL SCIENCES

Journal website: https://journals.must.ac.ke

A Publication of Meru University of Science and Technology

In the Cultural Mirror: influence of cultural factors on adoption of sanitation practices in rural areas—a case of Nzaui Sub-County, Makueni County, Kenya

Grace Kasiva Eliud [1]*, Lilian Mukiri Kirimi[1], Kirema Nkanata Mburugu[2], Domenic Kiogora [1]

[1]*Meru University of Science and Technology, Meru, Kenya.*
[2]*University of Embu, Kenya.*

ARTICLE INFO

KEY WORDS

cultural factors

sanitation practices

rural areas

improved sanitation

ABSTRACT

Provision of adequate sanitation is among the common approaches of preventing sanitation-related diseases. However, provision of sanitation facilities may not be a sustainable sanitation solution unless the population's behavior changes and a positive perception is embraced. This paper examined the influence of cultural factors on adoption of sanitation practices in rural areas. The article was based on field research that employed convergent research design where both qualitative and quantitative data was gathered simultaneously. Quantitative data was gathered using structured questionnaires from 100 household heads selected using stratified and proportionate simple random sampling techniques. Qualitative data was collected using an interview guide from a purposively selected focus group consisting of 9 participants. The findings were organized into themes and presented in narratives. Quantitative data was analyzed using the Statistical Package for Social Sciences (SPSS) version 25 which generated descriptive and inferential statistics to unveil the relationship between variables. From the findings, adoption of unimproved toilets was the main form of sanitation practices covering a mean of 3.3094. A unit increase in gender roles led to a 0.147 increase in adoption of sanitation practices (p-value=0.000) and a unit increase in traditions led to a 0.032 decrease in adoption of sanitation practices (p-value=0.014) in the area. Some denominations associated diarrhea with demons other than poor sanitation which was seen to facilitate poor sanitation practices. Residents believed that faeces left in the open could be used for witchcraft purposes, a tradition which had a positive impact on eradicating open defecation. Gender roles like fetching water, collecting firewood and livestock rearing in lonely places facilitated open defecation. The study recommended women inclusion in household sanitation matters and incorporation of religious leaders as advocates of sanitation behavior change. The study also recommended the need for future studies to examine adoption of sanitation practices alongside environmental, demographic and economic factors.

* Corresponding author: Grace Kasiva. Email: graceliud@gmail.com

https://doi.org/10.58506/ajstss.v1i2.19

AFRICAN JOURNAL OF SCIENCE, TECHNOLOGY AND SOCIAL SCIENCES ISSN :2958-0560
https://journals.must.ac.ke

Introduction

The Sustainable Development Goal agenda 6.2 targets to achieve universal basic sanitation and hygiene and an end of open defecation by 2030 (United Nations, 2018). Provision of adequate sanitation has been pointed out as one of the common strategies of preventing sanitation-related diseases such as diarrhea (Busienei et al., 2019). However, according to Novotný et al. (2017), sanitation projects fail after few years due to acceptability and sustainability issues. Efforts by governments to improve sanitation services have unexpectedly yielded poor outcomes as even where toilets are available, people still practice open defecation (Busienei et al., 2019). In rural areas, sanitation is surrounded by cultural issues (Wasonga et al., 2016) which should be addressed before providing sanitation solutions else such solutions be unacceptable. Thus, provision of latrines alone may not be a sustainable sanitation solution unless the population's behavior changes and positive perception embraced. The study was designed to explore the influence of cultural factors on adoption of sanitation practices in rural areas.

Maximizing access and use of safely managed sanitation facilities reduces the risk of human contact with excreta (Wasonga et al., 2016). Contact with excreta from unsafe sanitation facilities could result in diarrheal incidences responsible for 88% of children deaths in Sub-Saharan Africa (Demissie et al., 2021). When sanitation facilities are safe, adequate and are utilized by both rural and urban population, health facilities would receive fewer sick residents. Although the importance of safe sanitation facilities is acknowledged, reports by WHO/UNICEF (2021) show that 3.6 billion people globally access unsafe sanitation facilities where 14% defecate in the open with the majority from developing countries. In developing countries like Kenya, only 33% of the population use sanitation facilities which separate them from contact with excreta and 9% still practice open defecation (WHO/UNICEF, 2021). Inadequate adoption and use of sanitation facilities could be associated with cultural factors. Adoption and use of sanitation facilities is thus likely to be more successful when the communities' cultural perspectives are considered which was the focus of the study.

The role of gender in sanitation programming has been reported to constrain access to suitable sanitation facilities specifically for females (Caruso et al., 2017; O'Reilly, 2016; Khanna & Das, 20s16). While exploring the sanitation practices among 69 participants in India, a study by Caruso et al. (2017) found that men had the primary role of constructing toilets while women participated in household chores. The study reported that when men took charge of toilet construction, the facilities were located far from the households such that women feared visiting or taking their children to the toilets. A similar study in India by Routray et al. (2017) found out that in 80% of the households, power dynamics were limited to one gender. When involvement is skewed in sanitation matters, facilities established may be insecure and unacceptable to the users. In Odisha, a study by Sahoo et al. (2015) on sanitation stressors for women established that when men were the primary decision makers, the available toilets were unsafe for use and did not accommodate menstrual hygiene needs. The study showed that women struggled to cross high fences and walls to identify safer defecation sites and alternative solutions to dispose used sanitary materials with less anxiety. Unless sanitation policies embrace gender empowerment, gender-based sanitation inequalities could continue being rampant. Given that gender roles may vary with communities, it was necessary to examine its influence on adoption of sanitation practices in the study area.

The presence of toilets and their use is rooted in traditions and beliefs (Stopnitzky, 2017; Wasonga et al., 2016). In India, Stopnitzky (2017) established that construction of latrines was mandatory for males' households who wished to acquire a bride. The study showed that men could not marry without first constructing a latrine, a practice which saw an increase in adoption of toilet use by 21%. Adoption and use of toilet facilities could eliminate exposure of people to sanitation-related infections. Although traditions in India spearheaded construction of sanitation facilities, the situation in Kenya was different. A study by Wasonga et al. (2016) in Kenya found out that latrines were set apart for men and women and that each household was required to have a separate toilet for in-laws. Mixing of faeces for in-laws in a single toilet was a taboo. Separation of toilets for family members could however be quite expensive for the families. The study further established that when toilet facilities were not readily available, respondents defecated in holes around the households especially at night. Improperly disposed human faeces could be breading sites for diarrheal pathogens which are ferried to the rivers during rainy seasons causing water contamination. Consumption of such contaminated water could result in water-borne diseases such as dysentery. Although such findings were reported in Kenya, different communities could have different traditions which affect toilet use. The study explored the beliefs and traditions surrounding sanitation practices among communities within the study area.

Concepts of purity and pollution are well recognized values for different religions (Dwipayanti et al.,

2019. Although the influence of religion on sanitation practices is conceptualized as less obvious, some values could interfere with toilet adoption and use for people who deeply embrace them. In Indonesia, a study by Dwipayanti et al. (2019) that explored the local values related to sanitation uptake established that latrine construction near households could cause misfortunes. Such misfortunes were associated with certain spirits believed to reside near homes. The study also found out that traditional healers associated the cause of diarrheal diseases to unseen supernatural beings. Although religious values should be respected, some could encourage ignorance of responsibilities in sanitation and promote poor excreta management. In South Africa, Vyas and Spears (2018) found out that Hindus defecated in the open due to the rituals of purity which considered latrine construction near homes as a source of pollution. Failure to accept and make use of the available toilets may result in inefficient excreta management which could facilitate serious public health and environmental consequences.

Existing studies for instance by Routray et al. (2017), Wasonga et al. (2016), Busienei et al. (2019) and Angoua et al. (2018) examined sanitation issues in culturally different areas concentrating on urban, peri-urban and informal settlements. Given that cultural issues differ from region to region (Wasonga et al., 2016), there exists insufficient documentation on the influence of cultural factors on adoption of sanitation practices in rural areas which was the focus of the study.

Problem statement

The need for universal access to safe sanitation has been underscored in the Kenya vision 2030 agenda on sanitation as a fundamental facet towards eradication of diarrheal morbidities, poverty and possible mortalities (United Nations, 2018). Universal access to sanitation can only be attained through adoption and active use of improved sanitation facilities to ensure complete separation of human contact from excreta (WHO/UNICEF, 2021). However, the types of latrines adopted in developing countries, Kenya included, are sometimes rudimental and residents lag behind in attaining the expected sanitation behaviors.

Approaches instituted by the government to promote improved sanitation such as community-led total sanitation and creation of awareness have not shown complete effectiveness in triggering a sustainable sanitation behavior change. Although toilets may be provided, some communities continue to defecate in the open. Provision of toilets while ignoring the influence of cultural factors on adoption of sanitation practices could result in adoption of unacceptable toilets which are not used, which may continue keeping communities down the sanitation ladder. This may make them miss the target of attaining the expected sanitation standards. With the existence of a paucity in research on the influence of cultural factors on adoption of sanitation practices, it was necessary to explore the issue.

Objective

The objective of the study was to examine the influence of cultural factors on adoption of sanitation practices in rural areas.

Methodology

Study design

In this study, the researchers adopted a convergent mixed methods research design which enabled simultaneous gathering of both quantitative and qualitative data.

Study site

This study was carried out in Nzaui Sub-County, a region in Makueni County. It is a water-stressed region predominantly inhabited by the Kamba tribe, who live in homesteads containing male household heads, their wives, children, and sometimes their children's families. The area also experiences prolonged episodes of drought. Previous reports confirmed that the region has almost half of its inhabitants possessing unimproved sanitation facilities and that the annual expenditure of the County government in dealing with the impacts of poor sanitation surpasses $6.38 million (World Bank, 2019).

Target population

This study targeted household heads aged above 18 years from households within Nzaui Sub-County. The total number of households is 30806 (KNBS, 2019). Households were targeted because members of the same household share a single toilet block (Mwirigi et al. 2019). Household heads were considered because it was believed that they comprehensively understood matters on their households and could give accurate information concerning sanitation matters for their homes. The study also targeted Community Health Volunteers, Public Health Officers, masons and a chief. Researchers in this study believed that the group possessed in-depth information and knowledge on matters of sanitation at the household and community level.

Sample size determination

The number of participants required for the study was calculated using Yamane's (1967) formula. Yamane (1967) recommended a 5% margin of error in sampling. However, Adam (2021) proposed a remodeling to the sampling error to be up to 10% at all confidence levels which has also been successfully used by other researchers in their studies (Ali et al. 2021; Mugenda & Mugenda, 2012; Islam, 2018). The sample size was thus calculated as shown:

n=N/(1+N(e2)

Whereby, n represented the desired sample, N was the total target population size, and e was the sampling error (considered to be ±10%)

=30, 806 / (1+30, 806 (0.12) = 100 respondents.

Sampling technique

The researchers employed stratified sampling technique to categorize Nzaui Sub-County into five strata of its respective Wards namely; Mulala, Kalamba, Mbitini, Matiliku, and Nguu (KNBS, 2019). Researchers then considered proportionate simple random sampling technique to select household heads within households in the strata. Proportionate simple random technique was effective as it ensured that subjects, although from a population that was unevenly distributed, had an equal chance of being selected for participation (Creswel, 2013). To get the number of participants per stratum (ward), the total number of households per stratum was divided by the total households in the area then multiplied by the calculated sample size as shown in Table 1.

Ward		Number of Households per stratum or Ward (N_s)	Sample targeted per Ward (n_s) = (Ns/N) ×n
1.	Kalamba	4635	15
1.	Matiliku	4884	16
1.	Mbitini	6867	22
1.	Mulala	8051	26
1.	Nguu	6369	21
Total		Total households (N) = 30806	Desired sample size (n)=100

Table 1: *Distribution of samples in Nzaui Sub-County*

On the other hand, participants for the focus group discussion were selected using purposive sampling technique.

Data collection and analysis

Quantitative data was collected from 100 households using structured questionnaires which were self-administered. Open-ended interview guides aided in the collection of qualitative data from a focus group which consisted of 9 participants who included: 2 Community Health Volunteers, 1 area Chief, 2 Public Health Officers, 2 masons, and 2 household heads. The Statistical Package for Social Sciences (SPSS) version 25 was used in the analysis of quantitative data to generate both descriptive statistics and inferential results which illustrated the relationship between variables. Qualitative data was organized into themes guided by the objectives and was presented in narratives.

Ethical consideration

Ethical approval for carrying out this study was sought from the Meru University Institutional Research Ethics Review Committee (MIRERC). Participants gave informed consent before participating in the study and were assured of the safety of their information. To ensure safety of the information gathered, data in hardcopies was locked in a private box and soft copy data was password-protected and stored in a zipped file to avoid access by a third party.

Results and Discussion

Demographics

Results showed that more males (57%) than females (43%) participated in the study and that only 2% of the participants had not attained formal education. Christianity was the predominant religion taking 98% of the sampled population.

The findings suggested that men mostly took overall charge of household matters and women took lesser roles in making decisions. The fact that Christianity was the most common religion implied that there mostly existed no sanitation barriers tied to religion in the area. Almost all the residents were literate meaning that they understood the negative effects of poor sanitation.

Sanitation practices

Results yielded that 75% of residents used traditional pit latrines, 23% used ventilated improved pit latrines, 1% flush toilets and 1% did not possess a latrine. Adoption of unimproved toilets was the main form of sanitation practices and took a mean of 3.3094. Issues of latrine use including abandonment of available latrines had a mean of 2.6757 and open defecation was the least common form of sanitation practices with a mean of 2.5970.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1.Gender/gender roles and sanitation practices					
Males are the primary decision makers	1%	2%	9%	39%	49%
Male roles influence open defecation	15%	41%	21%	21%	2%
Female roles influence open defecation	7%	27%	31%	31%	4%
Toilet separation by gender influence toilet use	14%	39%	35%	9%	3%
2. Religion and beliefs and sanitation practices					
Association of diarrhea with demons	57%	39%	0%	3%	1%
Pit latrines harbour evil spirits	46%	48%	6%	0%	0%
Children faeces are not harmful	45%	36%	11%	6%	2%
Sanitation matters are prioritized in churches	62%	30%	0%	7%	1%
3.Traditions and sanitation practices					
Traditions held discouraging toilet construction	22%	69%	9%	0%	0%
Traditions encouraging open defecation	27%	71%	2%	0%	0%
Traditions held encourage toilet construction	6%	8%	6%	42%	38%

Table 2: *Influence of cultural factors on adoption of sanitation practices*

Traditional pit latrines are mostly unimproved sanitation options, and therefore the findings suggested that most of the toilets adopted exposed residents to the risks of poor sanitation through direct or indirect interaction with excreta. Results also showed that some residents felt uncomfortable with using the available sanitation options and responded by ignoring them.

Influence of cultural factors on adoption of sanitation practices

The degree of participants' agreement to various statements given in a 5-point Likert scale ranging from: 1-Strongly disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly agree was examined to reveal whether gender, religion, beliefs and traditions influenced adoption of sanitation practices. The results were as summarized in Table 2. Response was also sought from focus group discussion to and was presented in a narrative way.

Gender roles and adoption of sanitation practices

Response on the gender with the primary decision-making role was sought. From the results, 49% of the respondents strongly agreed that males were the decision makers on toilet construction, 39% agreed with the statement, 1% strongly disagreed and 2% disagreed. Regarding male roles, 15% of the participants strongly disagreed that male roles influenced open defecation, 41% disagreed while 21% agreed and only 2% strongly agreed that roles taken by men influenced defecation in the open. It is also evident in Table 2 that 4% of the respondents strongly agreed that female roles influenced open defecation, 31% agreed, 27% disagreed and 7% strongly disagreed. When asked whether toilet separation by gender influenced toilet use, 14% strongly disagreed that it influenced toilet use, 39% disagreed, 9% agreed and only 3% strongly agreed.

The findings suggested that men were the primary decision-makers on sanitation matters at the household level, a situation attributable to the cultural values in the area that men took control of household matters. This was confirmed in the focus group discussion where a male respondent said:

"Like in my home, I am the one who decides on every household matter, but when I am away, my wife can do that."

When men dominate household sanitation matters, the type of toilets proposed could overlook the menstrual and security needs of women in toilets and it might be less impossible for them to be convinced that good latrines are good investments. The fact that decision-making on toilet construction by men influence adoption of sanitation practices was echoed by Caruso et al. (2017) where the sanitation facilities established by men in rural Odisha were insecure such that women looked for alternative sites for defecation.

The roles played by females to a greater extent influenced open defecation compared to those of men. The fact that females were mostly engaged in household chores such as looking after children who have the tendency of defecating in the open, fetching water and collecting firewood in bushes where there were no toilets facilitated open defecation practices as revealed in the focus group discussion where female respondents said:

"In the evening I have to go to the forest to look for firewood and even sometimes rivers are far away. When we are there, we have no other option than using the bush."

"My children use diapers and sometimes they hide to defecate behind the house. You know you cannot know where the faeces are unless you follow keenly."

Some male roles included livestock rearing in lonely places with absence of toilets which facilitated defecation in the open.

"When you walk around the forests you will meet faeces for the boys who look after cows and goats."

The fact that gender roles influence sanitation practices was also confirmed by Routray et al. (2017) and O'Reilly (2016) in India.

The findings also showed that having separate toilets for males and females did not encourage their use. Findings from the few who agreed that separation of toilets by gender influenced toilet use could be attributed to the fact that males and females desired privacy and each gender would feel comfortable while using separate toilets. Similar conclusions were made in India by O'Reilly (2016) where sharing of toilets was a form of toilet insecurity especially for girls and women.

Religion and beliefs and adoption of sanitation practices

Aiming at establishing the influence of religion and beliefs on adoption of sanitation practices, respondents were asked to indicate whether diarrhea was associated with demons. Many respondents (57%) strongly disagreed, 39% disagreed, 3% agreed and 1% strongly agreed. Intending to establish their perception on pit latrines, respondents were required to indicate whether toilet pits haboured evil spirits. Of the participants, 46% strongly disagreed and 48% disagreed with the statement. Besides, 45% of the sampled population strongly disagreed that children's faeces were not harmful, 36% disagreed, 6% agreed and 2% strongly agreed with the opinion. About prioritization of sanitation matters in churches, 62% strongly disagreed that it happened, 30% disagreed, 7% agreed and only 1% strongly agreed.

It can be deduced from the findings that beliefs that would make people fear visiting toilets were not held in the area. Residents were aware of the real causes of diarrhea including poor sanitation. Some people showed support to the statement that diarrhea was caused by demons because there existed religions which held a strong belief on the role of demons in facilitating diseases. A respondent in the focus group discussion said:

"The people at risk of acquiring diarrhea are those who do not use toilets and leave their faeces in the open. Faeces left in open is carried to the rivers where people get diarrhea on consuming the water. It is good to appreciate each other's religion; I only know that some 'Kavonokyas' associate diseases with demons."

When people do not appreciate the real causes of sanitation-related diseases, they are likely to engage in negative practices such as toilet non-adoption and open defecation which expose members to the risks of contracting diseases. The role of religion and beliefs in facilitating sanitation practices was confirmed by Vyas and Spears (2018) in South Africa and Dwipayanti et al. (2019) in Bangladesh.

Findings also indicated that majority of the residents were aware that children's faeces was dangerous and could cause diseases. The widespread awareness could be ascribable to the high literacy levels in the region as people had attended school and understood the negative implications of poor sanitation. The study further showed that sanitation matters were rarely prioritized in religious gatherings such as churches.

Traditions and adoption of sanitation practices

Researchers also desired to find out whether there existed traditions which promoted adoption of sanitation practices in the region. Findings from Table 2 show that 22% of the respondents strongly disagreed that there existed traditions which discouraged toilet construction in Nzaui Sub-County, 69% disagreed

while there were no participants supporting the case. When asked whether there existed traditions encouraging open defecation in the community, 27% of the participants strongly disagreed, 71% disagreed, and none of the respondents supported the statement. Further, it was enquired of the participants whether there were then traditions that encouraged toilet construction in the Sub-County. From the report, 38% strongly agreed on the existence of such traditions, 42% agreed, 6% strongly disagreed and 8% disagreed.

The findings signaled that the traditions which existed in the area encouraged positive sanitation practices. These findings were supported by the results obtained from discussions in the focus group which revealed the practice of witchcraft on faeces left in the open as uttered by a respondent:

"People fear leaving their faeces in the open as they might be taken for witchcraft purposes. You know when you leave your faeces in the open, a witch will carry your faeces, pour ash on it and make you develop rashes around the anal parts."

Similar findings on the positive influence of traditions on sanitation were also reported by Stopnitzky (2017) in India where the traditions held there encouraged toilet construction. Traditions of this sort could encourage people to actively adopt, and make use of, sanitation facilities.

Correlation analysis

Correlation analysis was done using Pearson's Product Moment technique to establish the link between indicators of cultural factors such as gender and gender roles, religion and beliefs, and traditions, and adoption of sanitation practices. The correlation between variables was significant when the significance (P) value was below 0.05. The outcomes illustrated in Table 3 show the existence of significant correlation between cultural indicators and adoption of most various forms of sanitation practices.

Results from Table 3 show that the correlation between gender roles and latrine use was significant (r=0.324, p-value=0.001<0.05). Gender roles and open defecation also recorded a positive and significant relationship (r=0.477, p-value=0.000<0.05). There was no significant relationship between gender roles and improved toilets given a p-value greater than 0.05. The correlation between religion and beliefs and latrine use was negative and significant (r= -0.287, p-value=0.004<0,05). The correlation between religion and beliefs with open defecation and with improved toilets was non-significant. Further, the correlation between traditions and open defecation was -0.259 and also significant with a p-value of 0.009<0.05.

These findings suggested that latrine use issues increased with gender roles and that gender roles facilitated increased open defecation practices. On the other hand, the negative relationship between religion and beliefs and latrine use suggested that religion and beliefs in the area minimized chances of latrine use. Further, results on the negative relationship recorded between traditions and open defecation suggested that the traditions held in the area reduced chances of open defecation.

Regression analysis

This study targeted to examine the influence of cultural factors on adoption of sanitation practices. It had been evidenced in the literature that cultural factors could facilitate adoption of sanitation practices. The dependent variable (adoption of sanitation practices) was measured against cultural factors to show the variables' extent of relationship. Results were as illustrated in Table 4.

From the findings, r=0.411, a suggestion that cultural factors had a moderately strong association with adoption of sanitation practices. All the cultural fac-

		Latrine use	Open defecation	Improved toilets
Gender roles	Pearson Correlation	.324	.477	.041
	Sig. (2-tailed)	.001	.000	.085
Religion and beliefs	Pearson Correlation	-.287	.095	.138
	Sig. (2-tailed)	.004	.056	.068
Traditions	Pearson Correlation	.065	-.259	.055
	Sig. (2-tailed)	.518	.009	.587

Correlation is significant at the 0.05 level (2-tailed)

Table 3: *Correlation between cultural factors and various forms of sanitation practices*

Table 4: Regression results on the influence of cultural factors on adoption of sanitation practices

Model	Unstandardized Coefficients		Standardized Coefficients	p-value
	B	Std. Error	Beta	
(Constant)	2.448	.168		.000
Gender/gender roles	.147	.038	.378	.000
Religion & beliefs	.042	.041	-.098	.305
Traditions	-.032	.032	.098	.014
Predictors-Gender/gender roles, religion & beliefs and traditions				
Dependent variable- adoption of sanitation practices				
R=0.411				
R-Square=0.169				
F (2.6802) = 6.579 at p=0.000<0.05				

Table 4: *Regression results on the influence of cultural factors on adoption of sanitation practices*

tors studied here explained 16.9% of the variation in adoption of sanitation practices in the study area. Thus, 83.1% of the sanitation practices in Nzaui Sub-County were attributable to numerous other factors not studied in this study. Cultural factors like gender roles (β=0.147, p=0.000<0.05) and traditions (β= -0.032, p=0.014<0.05) were statistically significant. However, the relationship between religion and beliefs and adoption of sanitation practices was non-significant (β=0.042, p=0.305>0.05). These findings signified that when all other variables are held constant at zero, a unit increase in gender roles led to 14.7% increase in adoption of sanitation practices; a unit increase in traditions lowered adoption of sanitation practices by 3.2% while a unit increase in religion and beliefs, though non-significant, led to 4.2% increase in adoption of sanitation practices.

The calculated F value at 5% significance level was 6.579 which was more than the F critical value (2.6802), an indication that the relationship between the cultural factors considered in this study and adoption of sanitation practices was statistically significant.

The regression findings can be summarized in a regression model as follows:

Y= 0.147X1+0.042X2-0.032X3

whereby, Y represented adoption of sanitation practices

X1= gender roles, X2= religion and beliefs, and X3= traditions.

Conclusion

It can be concluded that access to improved sanitation is still a challenge in rural areas somewhat due to the influence of cultural factors like gender roles, religion and beliefs. De-mystifying beliefs that could facilitate adoption of poor sanitation can go a long way into promoting safe sanitation. This study also concluded that women experience sanitation stressors at the household level because they are rarely consulted on decisions regarding sanitation matters.

Recommendations and future research

Given the findings that men took charge of household decision-making, this study recommends women inclusion in household sanitation matters to ensure that the sanitation facilities adopted at the household level are friendly and acceptable to women and children. As well, there is need for sanitation policies to embrace gender empowerment in order to reduce gender-based sanitation inequalities in rural areas.

Innovative approaches of planning based on cultural contexts and communities' conditions are essential for a faster sanitation progress in rural areas. These approaches should not only involve local actors but also engage religious communities for behavior change communication to increase awareness on safe sanitation in gatherings.

The findings showed that all the cultural factors examined in this study only explained 16.9% of the variation in adoption of sanitation practices in the study area. This is was an indication that 83.1% of the sanitation practices are attributable to other various factors not studied here. There is need for future studies to examine adoption of sanitation practices alongside environmental, demographic and economic factors.

Competing interests

The authors declare that there are no competing interests.

Acknowledgement

Utmost gratitude to the participants from Nzaui Sub-County for dedicating their precious time in participating in this study. This work would not have been a success without you.

References

Adam, A. M. (2021). A Study on Sample Size Determination in Survey Research. New Ideas Concerning Science and Technology Vol. 4, 125-134. https://stm.bookpi.org/NICST-V4/article/view/135

AduGyamfi, S. (2018). Religion and Sanitation in a City in Ghana: A Conundrum? Available at SSRN 3211389. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3211389

Ahmed, S. K., & Ahmed, S. S. (2017). Socio-cultural acceptability of urine diverted composting toilets: A review of literature for possible adoption in peri-urban areas as a sustainable sanitation solution. In AIP Conference Proceedings (Vol. 1919, No. 1, p. 020043). AIP Publishing LLC. https://aip.scitation.org/doi/abs/10.1063/1.5018561

Alhassan, A., & Anyarayor, B. K. (2018). Determinants of adoption of open defecation-free (ODF) innovations: A case study of Nadowli-Kaleo district, Ghana. Journal of Development and Communication-Studies, 5(2),54-69. https://www.ajol.info/index.php/jdcs/article/view/174596

Ali, A. G., Muema, W., & Muriuki, M. (2021). Influence of Profitability on Dividend Payout in Deposit-Taking Savings and Credit Co-Operatives (SACCOs) in Kenya. International Academic Journal of Economics and Finance, 3 (7), 147, 158, 2. http://41.89.31.5:8080/bitstream/handle/123456789/1278/Abdirahman%20Gaal%20Ali..pdf?sequence=1&isAllowed=y

Angoua, E. L. E., Dongo, K., Templeton, M. R., Zinsstag, J., & Bonfoh, B. (2018). Barriers to access improved water and sanitation in poor peri-urban settlements of Abidjan, Côte d'Ivoire. PloS one, 13(8), e0202928. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0202928

Busienei, P. J., Ogendi, G. M., & Mokua, M. A. (2019). Open defecation practices in Lodwar, Kenya: a mixed-methods research. Environmental health insights, 13, 1178630219828370. https://journals.sagepub.com/doi/abs/10.1177/1178630219828370

Caruso, B. A., Clasen, T. F., Hadley, C., Yount, K. M., Haardörfer, R., Rout, M., & Cooper, H. L. (2017). Understanding and defining sanitation insecurity: women's gendered experiences of urination, defecation and menstruation in rural Odisha, India. BMJ global health, 2(4), e000414. https://gh.bmj.com/content/2/4/e000414.abstract

Creswell, J. W. (2013). Steps in conducting a scholarly mixed methods study. https://digitalcommons.unl.edu/dberspeakers/48/

Demissie GD, Yeshaw Y, Aleminew W, Akalu Y (2021) Diarrhea and associated factors among under five children in sub-Saharan Africa: Evidence from demographic and health surveys of 34 sub-Saharan countries. PLoS ONE 16(9): e0257522. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0257522

Dwipayanti, N. M. U., Rutherford, S., & Chu, C. (2019). Cultural determinants of sanitation uptake and sustainability: local values and traditional roles in rural Bali, Indonesia. Journal of Water, Sanitation and Hygiene for Development, 9(3), 438-449. https://iwaponline.com/washdev/article-abstract/9/3/438/67544

Islam, M. R. (2018). Sample size and its role in Central Limit Theorem (CLT). Computational and Applied Mathematics Journal, 4(1), 1-7.

Kenya National Beaural of Statistics. (2019). Kenya Populations and Households census data, (2). https://housingfinanceafrica.org/app/uploads/VOLUME-II-KPHC-2019.pdf

Khanna, T., & Das, M. (2016). Why gender matters in the solution towards safe sanitation? Reflections from rural India. Global public health, 11(10), 1185-1201. https://www.tandfonline.com/doi/abs/10.1080/17441692.2015.1062905

Mugenda, O. M., & Mugenda, A. G. (2012). Research Methods: Quantitative and Qualitative Approaches. Nairobi: Acts Press. https://www.coursehero.com/file/p5r1ept/Mugenda-OM-Mugenda-AG-2012-Research-Methods-Quantitative-and-qualitative/

Mwirigi, S. N., Muchiri, E. M., Kubai, P., & Kamari, K. M. (2020). Effect of Social Demographic Factors on Utilization of Pit Latrines in Tigania East, Meru County, Kenya.

Novotný, J., Kolomazníková, J., & Humňalová, H. (2017). The role of perceived social norms in rural sanitation: an explorative study from infrastructure-restricted settings of South Ethiopia. International journal of environmental research and public health, 14(7), 794. https://www.mdpi.com/209830

O'Reilly, K. (2016). From toilet insecurity to toilet security: creating safe sanitation for women and girls. Wiley Interdisciplinary Reviews: Water, 3(1), 19-24. https://doi.org/10.1002/wat2.1122

Pandya, M. N., & Shukla, P. S. (2018). Role of women led sanitation in community development. Journal of Content, Community and Communication, 7(4),

71-77. https://www.amity.edu/gwalior/jccc/pdf/jcc-journal-june-2018-edited-final-78-84.pdf

Routray, P., Torondel, B., Clasen, T., & Schmidt, W. P. (2017). Women's role in sanitation decision making in rural coastal Odisha, India. PloS one, 12(5), e0178042. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0178042

Sahoo, K. C., Hulland, K. R., Caruso, B. A., Swain, R., Freeman, M. C., Panigrahi, P., & Dreibelbis, R. (2015). Sanitation-related psychosocial stress: a grounded theory study of women across the life-course in Odisha, India. Social science & medicine, 139, 80-89. https://www.sciencedirect.com/science/article/pii/S0277953615300010

Stopnitzky, Y. (2017). No toilet no bride? Intrahousehold bargaining in male-skewed marriage markets in India. Journal of Development Economics, 127, 269-282. https://www.sciencedirect.com/science/article/pii/S0304387817300342

United Nations. (2018). Sustainable Development Goal 6 Synthesis Report on Water and Sanitation.

Vyas, S., & Spears, D. (2018). Sanitation and religion in South Asia: what accounts for differences across countries? The journal of development studies, 54 (11), 2119-2135. https://www.tandfonline.com/doi/abs/10.1080/00220388.2018.1469742

Wasonga, J., Okowa, M., & Kioli, F. (2016). Sociocultural determinants to adoption of safe water, sanitation, and hygiene practices in Nyakach, Kisumu County, Kenya: a descriptive qualitative study. Journal of Anthropology, 2016. https://downloads.hindawi.com/archive/2016/7434328.pdf

WHO/UNICEF Joint Water Supply and Sanitation Monitoring Programme. (2021). Progress on Household Drinking Water, Sanitation and Hygiene 2000-2020. https://www.washdata.org/

World Bank. (2019). Makueni County inclusive sanitation strategy: Situation analysis: Technical Assistance for Supporting Kenya to Tackle Sanitation Challenges. http://documents1.worldbank.org/curated/ar/403001588139210739/pdf/Makueni-Countywide-Inclusive-Sanitation-Strategy.pdf

Yamane, T. (1967). Statistics: An introductory analysis (No. HA29 Y2 1967). https://agris.fao.org/agris-search/search.do?recordID=XF2015012998