International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2019): 7.583

Effect of Knowledge and Culture on Utilization of Pit Latrines in Tigania East, Meru County, Kenya

Sylvia Nkatha[1], Peter Muteti[2], Eric Muchiri[3], Jane Ruto[3]

[1]Department of Public Health, Footprints Community International, Kenya
Email: *sylviankatha2005[at]gmail.com*

[2]Nuffield Centre for International Health and Development(NCIHD), University of Leeds, UK

[3]Department of Public Health, School of Health Sciences, Meru University of Science and Technology (MUST), Kenya

Abstract: ***Introduction: The major cause of childhood diseases in Kenya is related to issues of poor sanitation. More than 19,500 people die every year from diarrhoea of which 17,100 are children. Diarrhoea accounts for 16% of deaths among children aged below 5 years hindering the achievement of Sustainable Development Goal 6. Pit latrine coverage in Meru County was 60%, thus encouraging open defecation (OD) (Njuguna, 2019). Aim: To analyse the effect of knowledge and culture on the utilization of pit latrines in Tigania East Sub-County. Methods: A descriptive cross-sectional survey involving 369 respondents selected by systematic random sampling from different households across the sub-county was utilized. Descriptive analysis, multiple regression, and odds ratios were pulled from SPSS 23 with the utilization of pit latrine being the dependent variable. Results: The study revealed a positive association between knowledge of pit latrines and utilization (R=.409, P=0.00) (x^2=13.49, P=0.00). Knowledgeable respondents were 1.83 times more likely to utilize pit latrines that those who were not exposed. The study revealed that a positive relationship exists between the socio-cultural factors and taboos on the decisions to buy the upgrades on the utilization (R=.576, P=0.00), (F=55.823, P=0.00) and (X^2 =36.671, P=0.00). The study found a strong negative association between taboos with utilization (R=.398, P=0.00), (F=21.112, P=0.00). Conclusion: Partnerships with donors striving to increase social marketing curbing taboos against utilization are very essential in Tigania East. Campaigns to improve sanitation knowledge targeting both Men and Women are recommended.***

Keywords: Pit Latrine, Utilization, Open Defecation, social demographic and households

1. Introduction

Sanitation and hygiene issues are the major causes of many childhood diseases in Kenya. Further, (WHO, 2020) stated that annually, 1.5 million children die because of diarrhea; deaths attributable to the combined impacts of inadequate sanitation, and poor personal hygiene. In Kenya, at least 14% (7.5 million people) of the total population (approx. 47,500,000 people) practice open defecation (Njuguna, 2019). This explains why the prevalence of diseases such as diarrhea, amoeba, typhoid and cholera will continue to persist unless drastic action is taken to raise the knowledge and awareness levels on latrine use, change attitudes towards the use of latrines as well as promote the adoption of appropriate latrine hygiene practices at the household level (Busienei et al., 2019).

Diarrhea and related illnesses account for 16% of deaths among the children below 5years and stand second to pneumonia in Meru County (Achoki et al., 2019). In most health facilities in Tigania East Sub County, diarrhea diseases rank as the third cause of outpatient illness among outpatient attendance (Routray et al., 2015). There is an extensive association between Diarrhea and open defecation. This is the case since, open defecation contaminates the environment with microorganisms, which are causative agents for diarrhea diseases (Godana & Mengistie, 2017).

Improving sanitation is not limited to physical-structural aspects but also includes having the correct knowledge on latrine use, proper use and maintenance of latrine facilities as well as behavior change towards more hygienic practices (Chanie et al., 2016).

However, lack of proper knowledge on the construction and maintenance of pit latrines within the household is another factor hindering the utilization of latrines (Thys et al., 2015). This has resulted in poor quality construction, basic design faults, unsafe pits, and poor maintenance (Leshargie et al., 2018). This study, therefore, sought to analyze the effect of knowledge and culture on the utilization of pit latrines in Tigania East Sub-County.

Social-cultural factors can also significantly hinder utilization of pit latrines. The study by Routray et al. (2015) found that habits, socializing, sanitation rituals, and daily routines varying with caste hindered the adoption of latrines. The authors, therefore, recommended that future sanitation programmes need to focus on understanding and addressing these behavioural barriers. The study by (Nunbogu et al., 2019) found that social context is a significant determinant of households' latrine completion decisions. The study, therefore, emphasized the need for continuous sensitization and social marketing.

2. Methods

This study was conducted in Meru County, Tigania East Sub-County between June and August 2018. The study is a descriptive cross-sectional survey (Chanie et al., 2016; Gebremedhin et al., 2018; Routray et al., 2015).

A sample of 369 respondents comprising of the household heads was selected by systematic random sampling method across the Tigania East Sub-County. Descriptive analysis, multiple regression, and Odds ratios were pulled from SPSS 23. The utilization of pit latrines was used as the dependent variable. The social demographic factors, including age, income, education, marital status, and employment were used.

2.1 Sampling method

Out of the 29,810 households in Tigania East Sub-County, 369 were sampled with the household heads being the respondents hence 369 respondents. Tigania East Sub-County has a population of 157,246 people. However, a single latrine block is shared amongst household members hence the reason for sampling households. The sample size calculation was done using the Cochran 1977 formula (Glenn, 2020)

Therefore, the required sample size was 369 households (where the head of the household was picked). Using Kerlinger, Kth household, an Interval of 1 household in every 80 households was used.

2.2 Data Collection and Analysis

Ethical clearance was issued by Meru University of Science and Technology (MUST) Institutional Research Ethics Review Committee (MIRERC). A structured questionnaire was administered. The questionnaire was pre-tested in 37 households in the Gankere market in North Imenti Sub-County which borders Tigania East Sub-County. The instruments were tested for reliability yielding a Cronbach's alpha of 0.75 and therefore considered reliable. The data was entered and analyzed using SPSS Software Version 23. Descriptive analysis, multiple regression, and Odds ratios were pulled with utilization of pit latrine being the dependent variable. The results were presented using descriptive and inferential statistics.

2.2.1 Response rate and reliability

The total questionnaires issued across the community in the sub-county were 369 and a subsequent observation checklist for each household. Out of the total 369 questionnaires issued, 21 were not returned during data collection while 6 were wrongly filled so they were never considered in this study.

Therefore, 342 respondents were considered in this study. This was a 93 percent response rate, which is considered a good response. The next sub-sections will be analyzed and presented based on each objective.

The study instruments were subjected to scale reliability to measure whether they measured what they were meant to. The reliability statics yielded a Cronbach's alpha coefficient of 0.718, and therefore the instrument was considered reliable

3. Results

3.1. Knowledge and diarrhea prevention.

The study results revealed that knowledge on whether pit latrines could prevent diarrhea significantly affected utilization positively (table 1). Specifically, respondents who knew that pit latrines can prevent diarrhea were 2.2 times likely to utilize pit latrines than those who did not. (OR 2.2) The chi-square (X^2 =10.325, P=0.01) confirms the level of dependency.

3.2 Sources of information on sanitation

On establishing the sources of this information, the study found that over 64 percent received the information mainly from Community health volunteers (CHV's) with the rest being informed by Public health officers (PHOs) and media as well as media alone (Figure 1)

In particular, the respondents were asked whether they had seen, heard, or received any messages or materials on sanitation and hygiene in the last year. The study results found that utilization is independent of the source of information (x^2=19.57, P=0.00).

3.3 Regression model

The study sought to find out whether any relationship exists between knowledge and utilization of latrines. The study found a positive association between knowledge of pit latrines and utilization (R=.409, P=0.00). Specifically, information sources on the importance of pit latrines and exposure to such messages and materials on sanitation and hygiene significantly affects utilization. This relationship is further confirmed by the ANOVA and Chi-square statistics as follows respectively (F= 13.495, P=0.00) (X^2=19.573, P=0.00).

3.4 Exposure to messages or materials on sanitation

The study sought to find out the level of exposure to information on sanitation by different households. The study results indicated that about 31.28 percent had access to information with 68.72 percent never received any information regarding sanitation and hygiene. Further, the study found that respondents for the cohort that had been exposed to messages or materials on sanitation and hygiene were 1.83 times more likely to utilize pit latrines than those that weren't exposed to such information.

Table 1: Knowledge and diarrhea prevention

Knowledge factors					
		utilisation_pit latrine			
Variables	Categories	Yes(%)	No(%)	Chisquare,	odds ratios(95% CI)
pit latrine can prevent diarrhea	Yes	118(47)	133(53)	(x^2=10.3, P=.001)	OR=2.22
	no	26(28.6)	65(71.4)		
Do Pit Latrine use prevents diarrhea	Yes	111(48.1)	120(51.9)	(x^2=9.38, P=.002)	OR=2.18
	no	33(29.70	78(70.3)		
Information Sources on Im	public hea	109(49.1)	113(50.1)	(x^2=22.1, P=.000)	
	Public hea	17(20.5)	66(79.5)		
	Media	18(47.4)	19(53.6)		
Have you been exposed to	yes	99(47.8)	108(52.2)	(x^2=7.04, P=.008)	OR=1.83
	no	45(33.3)	90(66.7)		
Purpose of Building Pit Lat	for long ca	112(44.8)	138(55.2)	(x^2=2.79, P=.009)	OR=1.55
	both long	32(34.8)	60(65.2)		
	Total		100		

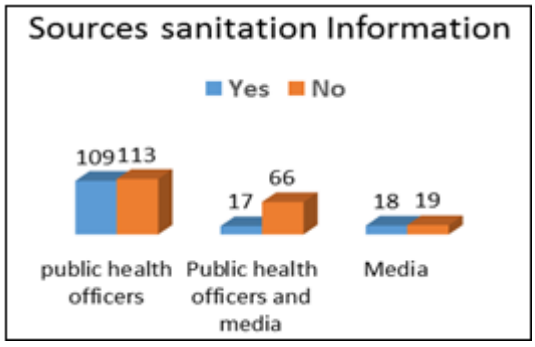

Figure 1: Sources of information on sanitation

3.5 Social-cultural factors

Majority of the households agreed that several members practice open defecation. In household 8, the respondent reported that; *"Men and especially the recently circumcised young men were very reluctant to use the same latrines with their mothers. Our culture does not allow us to be seen in the pit latrines by women especially during the daylight."* This signifies that culture significantly affected the perceived use of latrine especially by men who were forbidden to break the norm if seen coming out of the pit latrine to defecate during the day. Most households that owned pit latrines noted that they were built to cater to both long calls and short calls. Assessment of privacy, whether going for a call of nature is seen or unseen by people, was an issue of concern. The study found that over 72% of the respondents minded about privacy whereas less than 28% had no issue of privacy while defecating (Table 2)

Table 2: Social Cultural Factors

social cultural factors					
		Utilization of Pit			
Variables	categories	Yes	no	Chisquare	Odds Ratios
decision maker on	Husband	61(69.3)	27(30.7)	(x^2=36.67, P=.000)	
	wife	15(27.8)	39(72.2)		
	Both Husband	68(34)	132(66)		
sharing a pit latrine	no	51(35.2)	94(64.8)	(x^2=4.96, P=.002)	OR=1.22
	yes	93(47.2)	104(52.8)		

3.6 Decision maker on the purchase of upgrades

The study found that social-cultural factors significantly affect utilization of pit latrines. The results of the study revealed a positive relationship between the social-cultural factors such as who decides to buy the upgrades of latrines and utilization (R=.576, P=0.00), (F=55.823, P=0.00) and (X2 =36.671, P=0.00). This implies that if the decision of buying the latrines upgrades was predisposed to the respondent who has income then they would be regularly, ensure that the latrines are well maintained to enhance utilization. For instance, it is assumed since female respondents are the ones mostly involved in house chores, they would ensure that they observe cleanliness compared to the male respondents.

3.7 Cultural taboos and Utilization

Similarly, the study found that 64 percent of the respondents felt that sharing the toilet among males and females in the community was a taboo with 36 percent thinking it was not (Figure 2). Upon descriptively analyzing the responses, the study undertook a binary regression modeling of the factors associated with utilization of pit latrines and tested significance at 95% confidence levels. The study found a positive relationship between culture and taboos with utilization (R=.398, P=0.00), (F=21.112, P=0.00).

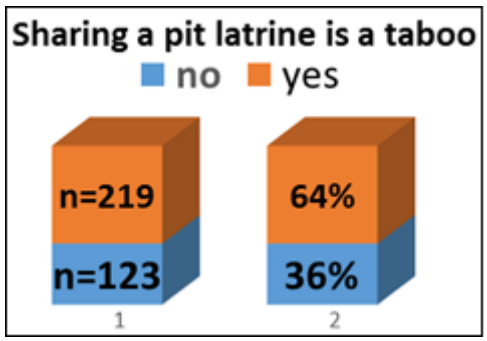

Figure 2: Taboos on sharing of pit latrines

4. Discussion of Results

Diarrhea, a disease mostly linked to poor sanitation and hygiene, is among the many causes of stunted growth in children. Over 8 million Kenyans still defecate in the open which results in the prevalence of diseases such as diarrhoea, amoeba, typhoid, and cholera (WHO, 2020). Although open defecation is among the known causes of diarrhea-related illnesses; pit latrine ownership neither means that a country will be a 100% open-defecation free (ODF) nor guarantees maximum latrine utilization.

The study sought to find out whether knowledge or awareness on the importance of using it latrines affected utilization. Specifically, the study explored the source of information, knowledge about sanitation, and the effect of consequences (Asfaw et al., 2016). The study results deduced that utilization is independent of the source of information (x2=19.57, P=0.00). Notably, the study revealed a positive relationship between knowledge and utilization (R=0.409, P=0.00), exactly 40.9 percent of utilization is explained by the model. This relationship is further confirmed by the ANOVA and Chi-square statistics respectively (F= 13.495, P=0.00) (X2=19.573, P=0.00). This implies that knowledge about sanitation and the effects of the consequences significantly affects individual behavior positively thus enhancing utilization. As a matter of principle, behavior change theory implies that knowledge is a predictor of behavior change. Therefore, sanitation campaigns, and programs depend on community awareness. Therefore, this study concluded that the knowledge of disease transmission and the health benefits of latrine uptake to promote latrine use. However, the results of this study were contrary to that of Lopez et al. (2019) who found that knowledge of the health benefits of sanitation may not be as `important. The study by Thys et al., (2015), notes that men are responsible for building latrines, and therefore sanitation programs should focus more often on men's knowledge and beliefs. Similarly, the results of this study concurred with those of Debesay et al. (2015) who noted that households with a household head's educational status of primary and above were 3.71 times [AOR=3.71, 95% CI: 1.52-9.09] more likely to utilize latrine than households with illiterate household heads. The possible elaboration for this is that education helps the literate household head to access the information about the advantages of latrine use from different sources than the illiterate household head.

The study sought to find out the effect of social demographic factors on utilization of pit latrines. The study found that social-cultural factors significantly affect utilization of pit latrines. The results of the study revealed a positive relationship between the social-cultural factors such as the member of the family who is responsible for deciding to buy the upgrades of latrines and utilization (R=.576, p=0.00),

(F=55.823, p=0.00), and (X^2 =36.671, P=0.00). It implies that if the woman was the one to make the decision the upgrades were likely to be bought and this could eventually encourage utilization. However, the beliefs and norms of the culture could still have significantly hindered the utilization of the pit latrine. The results of this study were consistent with that of Thys et al. (2015) who noted that some households may have sanitation facilities and still practice OD due to personal beliefs and customs. This may be intermittent e.g. cultures that do not allow one to share sanitation facilities with in-laws. When the in-laws visit, the head of the household may practice open defecation. According to the study by Thys et al., (2015), in India, a respondent among the tribal populations of India was reported saying, "*Our culture does not allow us to use the same toilet with your grown-up daughters, son or daughter-in-law, mother-in-law and all other people.*'' Further, in another study by Ashebir et al. (2013), a respondent reported that "*What has killed us in the villages are these cultural norms which we have clung to for so long. Our friends in town find nothing wrong with all this. They all use the same toilet in the house."* According to Nunbogu et al., (2019), the attitudes and beliefs about revulsion to feces varies between cultures. Examples are numerous in Africa. For instance, in the Akan culture (Ghana), the word "shit", is a taboo in itself, and when people are going to the bush to defecate, they need to wear a blinder pretending that they will not be seen by anyone (Nunbogu et al., 2019). In Uganda, sharing latrines with in-laws is a taboo and the use of latrines could affect women's fertility and cause miscarriage. In the Eastern Cape Province of the Republic of South-Africa, human feces were found in the bush because people were afraid to share latrines to avoid being bewitched (Thys et al., 2015). Routray et al. (2015) stated that women preferred defecating in a safe and convenient place where they could hide from the sight of males as they did not like to be seen by others during the act. For this reason, they did not mind walking long distances to reach fields away from their habitations to ensure that no one could recognize them (Obeng et al., 2015). Therefore, taboos and cultural beliefs could significantly hinder utilization of pit latrines if not well addressed through public health interventions.

5. Conclusion

The study revealed a positive association between knowledge of pit latrines and utilization (R=.409, P=0.00) (x^2=13.49, P=0.00). Knowledgeable respondents were 1.83 times more likely to utilize pit latrines that those who were not exposed to knowledge. The study revealed that a positive relationship exists between the social-cultural factors and taboos on the decisions to buy the upgrades on the utilization (R=.576, P=0.00), (F=55.823, P=0.00) and (X^2 =36.671, P=0.00). The study found a strong negative association between taboos with utilization (R=.398, P=0.00), (F=21.112, P=0.00).

Partnerships with donors striving to increase social marketing curbing taboos against utilization and campaigns to improve sanitation knowledge targeting both men and women are recommended.

6. Conflict of interest statement

None Declared

7. Funding

No funding sources

8. Authors Contribution

All the authors participated in all the study phases; from the conception of the study, protocol development, data collection and analysis, and manuscript preparation.

References

[1] Njuguna, J. (2019). Progress in sanitation among poor households in Kenya: Evidence from demographic and health surveys. *BMC Public Health*, *19*(1), 135. https://doi.org/10.1186/s12889-019-6459-0

[2] Achoki, T., Miller-Petrie, M. K., Glenn, S. D., Kalra, N., Lesego, A., Gathecha, G. K., Alam, U., Kiarie, H. W., Maina, I. W., Adetifa, I. M. O., Barsosio, H. C., Degfie, T. T., Keiyoro, P. N., Kiirithio, D. N., Kinfu, Y., Kinyoki, D. K., Kisia, J. M., Krish, V. S., Lagat, A. K., … Naghavi, M. (2019). Health disparities across the counties of Kenya and implications for policy makers, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Global Health*, *7*(1), e81–e95. https://doi.org/10.1016/S2214-109X (18)30472-8

[3] Routray, P., Schmidt, W.-P., Boisson, S., Clasen, T., & Jenkins, M. W. (2015). Socio-cultural and behavioural factors constraining latrine adoption in rural coastal Odisha: An exploratory qualitative study. *BMC Public Health*, *15*(1), 880. https://doi.org/10.1186/s12889-015-2206-3

[4] Godana, W., & Mengistie, B. (2017). Exploring Barriers Related to the Use of Latrine and Health Impacts in Rural Kebeles of Dirashe District Southern Ethiopia: Implications for Community Lead Total Sanitations. *Health Science Journal*, *11*(2). https://doi.org/10.21767/1791-809X.1000492

[5] Chanie, M, G., & K, K. (2016). Latrine Utilization and Associated Factors in Rural Community of Aneded District, North West Ethiopia, 2014. *Journal of Community Medicine & Health Education*, *6*(5), 1–8. https://doi.org/10.4172/2161-0711.1000478.

[6] WHO. (2020). *WHO | WHO/UNICEF highlight need to further reduce gaps in access to improved drinking water and sanitation*. WHO; World Health Organization. https://www.who.int/mediacentre/news/notes/2014/jmp-report/en/

[7] Debesay, N., Ingale, L., Gebresilassie, A., Assefa, H., & Yemane, D. (2015). Latrine Utilization and Associated Factors in the Rural Communities of Gulomekada District, Tigray Region, North Ethiopia, 2013: A Community Based Cross-Sectional Study.

Journal of Community Medicine & Health Education, *5*(2), 1–6. https://doi.org/10.4172/2161-0711.1000338

[8] Ashebir, Y., Sharma, H. R., Alemu, K., & Kebede, G. (2013). Latrine use among rural households in northern Ethiopia: A case study in Hawzien district, Tigray. *International Journal of Environmental Studies*, *70*(4), 629–636. https://doi.org/10.1080/00207233.2013.835533

[9] Busienei, P., Ogendi, G., & Mokua, M. (2019). Latrine Structure, Design, and Conditions, and the Practice of Open Defecation in Lodwar Town, Turkana County, Kenya: A Quantitative Methods Research. *Environmental Health Insights*, *13*, 1178630219887960. https://doi.org/10.1177/1178630219887960

[10] Dagnew, G. G. (2019). *Assessment of Latrine use and Associated Factors among Rural Community Members in Chiro Zuria Woreda Particularly in Kilinso and Nejebas Kebele*. *11*(410), 7.

[11] Wangui, G. M. (2016). *The Influence of Socio-cultural and Economic Factors on the Adoption of Ecological Sanitation Facilitiy: A Case Study of Mathare Slum of Ngong Town, Kajiado County, Kenya*. 109.

[12] Yimam, Y. T., Gelaye, K. A., & Chercos, D. H. (2014). Latrine utilization and associated factors among people living in rural areas of Denbia district, Northwest Ethiopia, 2013, a cross-sectional study. *The Pan African Medical Journal*, *18*. https://doi.org/10.11604/pamj.2014.18.334.4206

[13] Thys, S., Mwape, K. E., Lefèvre, P., Dorny, P., Marcotty, T., Phiri, A. M., Phiri, I. K., & Gabriël, S. (2015). Why Latrines Are Not Used: Communities' Perceptions and Practices Regarding Latrines in a Taenia solium Endemic Rural Area in Eastern Zambia. *PLoS Neglected Tropical Diseases*, *9*(3). https://doi.org/10.1371/journal.pntd.0003570

[14] Leshargie, C. T., Alebel, A., Negesse, A., Mengistu, G., Wondemagegn, A. T., Mulugeta, H., Tesfaye, B., Alamirew, N. M., Wagnew, F., Belay, Y. A., Ferede, A., Sintayehu, M., Dessie, G., Boneya, D. J., Birhanu, M. Y., & Kibret, G. D. (2018). Household latrine utilization and its association with educational status of household heads in Ethiopia: A systematic review and meta-analysis. *BMC Public Health*, *18*(1), 901. https://doi.org/10.1186/s12889-018-5798-6

[15] Glenn, I. (2020). *Samplesize.pdf*. University of Florida.https://www.tarleton.edu/academicassessment/documents/Samplesize.pdf

[16] Asfaw, B., Azage, M., & Gebregergs, G. B. (2016). Latrine access and utilization among people with limited mobility: A cross sectional study. *Archives of Public Health*, *74*. https://doi.org/10.1186/s13690-016-0120-5.

[17] Budhathoki, S. S., Shrestha, G., Bhattachan, M., Singh, S. B., Jha, N., & Pokharel, P. K. (2017). Latrine coverage and its utilisation in a rural village of Eastern Nepal: A community-based cross-sectional study. *BMC Research Notes*, *10*. https://doi.org/10.1186/s13104-017-2539-3

[18] Obeng, P. A., Keraita, B., Oduro-Kwarteng, S., Bregnhøj, H., Abaidoo, R. C., Awuah, E., & Konradsen, F. (2015). Usage and Barriers to Use of Latrines in a Ghanaian Peri-Urban Community. *Environmental Processes*, *2*(1), 261–274. https://doi.org/10.1007/s40710-015-0060-z.