

Original Research Article

Awareness of community-led total sanitation and its impact on sanitation among residents of Kilifi and Marsabit Counties, Kenya

Tobias Mbeya Omufwoko^{1*}, Alfred Owino Odongo¹, Mohamed Karama²

¹School of Public Health, Mount Kenya University, Kenya

²School of Public Health, Umma University, Kenya

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*Correspondence:

Dr. Tobias Mbeya Omufwoko,

E-mail: tomufwoko@yahoo.com

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ABSTRACT

Background: Community-based strategy known as community-led total sanitation (CLTS) is frequently employed to address open defecation and the health issues it causes. Inadequate sanitation is one of the biggest health and environmental problems in the world, contributing to approximately 775,000 deaths per year. This study aimed to assess the level of awareness of CLTS and its impact on sanitation among communities in Kilifi and Marsabit Counties in Kenya.

Methods: The study adopted a comparative study design. Purposive and multistage sampling were used to recruit study respondents in this study. Fischer's formula was used to determine the sample size for this investigation where 811 study participants were enlisted for the research. Propensity score matching (PSM) was used to estimate the impact of CLTS intervention on sanitation status. A significance level of 0.05 was employed as the threshold for all tests conducted in this study.

Results: From this study, among those fully conversant with CLTS, 98% resided in Kilifi County; 77% in Marsabit were fully aware of CLTS. The majority (87.7%) of the study respondents were fully aware of CLTS. Despite CLTS intervention resulting in a 42% increase in households owning a sanitation facility, there was no significant statistical association between CLTS intervention and sanitation status ($t=0.42$, $p=0.0835$).

Conclusions: The study established that the level of awareness of CLTS in both counties was high. The results from this study demonstrated that CLTS intervention programs had an impact on sanitation levels in Kilifi and Marsabit counties.

Keywords: Awareness, CLTS, Open-defecation free, Sanitation

INTRODUCTION

Water and sanitation access is a global issue. According to WHO and UNICEF's joint monitoring programme (JMP) report (on water supply and sanitation estimates), approximately 4.5 billion people, or 61% of the world's population, lacked access to safely supervised sanitation services.¹ This suggests that these people use a toilet or latrine that does not allow for the safe handling or disposal of waste. Furthermore, insufficient handwashing data were available to generate a global estimate.²

A handwashing station with soap and water was only available to 15% of the population in sub-Saharan Africa.¹ Additional research from the world bank's water supply, sanitation, and hygiene (WASH) poverty diagnostics for 17 countries worldwide has linked poor sanitation, especially open defecation, to stunting in children.³ Only 31% of Kenyans in urban areas and 30% in rural areas have access to improved sanitation, and more than 5.6 million still urinate outdoors. Diseases such as cholera, typhoid, amoebic, and diarrhea will persist if prompt action is not taken.⁴ An estimated yearly cost of

poor sanitation in Kenya is Kes 27 billion (365 million USD), or 0.9% of the nation's GDP.⁴

Ending open defecation would only require the construction and use of 1.2 million latrines, despite the fact that it costs Kenya \$88 million a year. The 2010 Kenyan Constitution's Article 43 declared sanitation to be a fundamental right because it was considered significant enough. This unsanitary condition is exemplified by the ongoing National Cholera outbreak, which primarily affected ministers and upscale establishments in Kibra, Nairobi.⁴ The 5.6 million Kenyans lack access to latrines and must defecate in the open, while over half of the country's population, or 21 million people, use filthy or shared washrooms.⁵ Environmental fecal pollution is the primary cause of the 3,500 cholera cases that occur in Kenya annually on average. An estimated US\$2.2 million will be spent each year on the necessary WASH response. Beyond the health system's immediate reaction, a cholera outbreak can have an impact on the economy.⁶ Diarrheal disease kills 19,500 Kenyans annually, including 17,100 children under five, according to WSP research. Inadequate access to water, sanitation, and hygiene is directly responsible for 90% of these deaths.⁷

In Kenya, the County government is in charge of providing sanitation, which is a constitutional right.⁸ One type of intervention to lessen open defecation has drawn attention from all over the world in recent years. In many nations, CLTS has been embraced and put into practice as a means of ending open defecation. The CLTS intervention consists of facilitating a process to encourage and empower rural communities to avoid open defecation and to build and use latrines, without offering financial assistance for the purchase of latrines or toilet construction materials.⁹ The most extensively used policy intervention for enhancing rural sanitation in low-income Kenya initiated the open defecation-free rural Kenya in May 2011. The government aimed to have an ODF Kenya by 2013, and an ODF Rural Kenya Roadmap 2011-2013 was developed. It also aimed to accelerate MDG 7, which the country did not achieve.¹⁰ By the end of the period, only 9,126 villages had been triggered. Three thousand nine hundred fifty-six had claimed ODF status, 2,567 had been verified, and a dismal 1,273 had been certified as ODF.¹⁰ As a result, this study aimed to assess the level of awareness of CLTS and its impact on sanitation among communities in Kilifi and Marsabit Counties in Kenya.

METHODS

Study design

A comparative study design was used in this research. To guarantee a correct description of the study variables and to highlight the actual state of CLTS in the two communities, it also featured an analytical cross-sectional study design that accurately described the variations in CLTS effectiveness between the two counties. The

research employed a quantitative methodology. Following the intervention phase, quantitative data for important parameters was collected and compared to quantitative baseline data obtained from secondary sources.

Study area

The research was conducted in Kenya's Kilifi and Marsabit Counties. The two study locations were selected using the purposive method as the criterion. CLTS has been implemented by the government in both counties according to protocols; however, because of their distinct social, economic, and geographic characteristics, it was necessary to compare the two in order to determine the results of CLTs in such circumstances. The socio-cultural and socio-economic diversity of Kenya, Africa, and the world is reflected in this study. Whereas the study area in Marsabit is semi-arid, nomadic, and food-deficient, the study area in Kilifi is agricultural. Despite having different sanitation issues, both are anticipated to become ODFs in Kenya at the same time by 2020.

Study population

Adult household heads (18 years of age and older) were the target demographic. All households in Saku and Rabai Sub counties from Marsabit and Kilifi County reports, totaling 371 villages (Saku 194 villages and Rabai 177 villages), made up the study population. Because both of these areas had a government CLTS project for a year, from November 2020 to November 2021, they were purposively selected.

Sample size determination

The sample size for this investigation, which involved recruiting 811 study participants, was determined using Fischer's formula.

Inclusion criteria

The following criteria were used to include participants in the study: Heads of households, age 18 years and above, must have lived for more than 12 months in the study area, must have consented to participate in the study.

Exclusion Criteria

The following criteria were used to exclude participants from the study: non household heads, persons under 18 years, persons who had lived in the study areas for less than 12 months, persons who did not consent to participate in the study and household heads who were critically ill.

Sampling technique

Purposive sampling was used to select the site of the study. These are Saku and Rabai Sub Counties in

Marsabit and Kilifi County. The villages inside the sub-counties were sampled using a multistage sampling technique, specifically a sort of cluster sampling where the population is divided into groups or clusters. Subsequently, a random selection was made of one or more clusters, and all individuals inside the selected cluster were included in the sample. The sampling method used was cluster sampling, specifically for selecting communities.

The study employed a sample frame to choose households and thereafter utilized simple random sampling to choose the households. These two areas were selected purposively. This is because they both had a government CLTS project for one year from November 2020 to November 2021.

Data collection tools and procedures

The quantitative data was gathered using a semi-structured questionnaire. Social demographic characteristics of the study respondents were captured in section A of the questionnaire. Section B of the questionnaire captured data on the level of awareness of CLTS among communities in Kilifi and Marsabit Counties in Kenya. Section C of the questionnaire captured data on the impact of CLTS intervention.

Statistical analysis

Stata version 15 was employed to analyze the qualitative data obtained in this study. Both frequency and percentages were employed to describe the social demographic characteristics of the study respondents. In addition frequencies and percentages were used to describe the level of awareness of CLTS among communities in Kilifi and Marsabit Counties in Kenya.

PSM was used to estimate the impact of CLTS intervention on the sample population in the two counties. The study's conclusive results were presented in the form of visual representations such as the tables and the pie charts.

Ethical consideration

The institutional research ethics and review committee (IREC) of MKU approved the study to be carried out. Permission to conduct research in both Kilifi and Marsabit counties was granted by the relevant office of the County government, and NACOSTI. Upon request from the researcher, each participant provided written informed consent. Before data collection, all participants signed a consent form after being fully informed about the purpose and importance of the study.

The confidentiality and privacy of the participants were upheld. An identity number was assigned to each participant in place of names in a questionnaire.

RESULTS

Social demographic characteristics

The demographic and socioeconomic details of the respondents are shown in Table 1. Females made up a sizable portion in both counties: 73.97% in Kilifi (n=304) and 60.75% in Marsabit (n=243). In Kilifi County, 23.84% of respondents were between the ages of 31 and 40, and 18.74% were over 61. The majority of study participants in Marsabit, 39.25% (n=157), were in the 21-30 age range. In both counties, the majority of people were married: Kilifi (81.0%) and Marsabit (71.5%). Christianity predominated in Kilifi (69.76%) and Islam in Marsabit (71.5%). It was also established that respondents' monthly incomes differed between the two counties. In Kilifi County, 56.69% of households made less than 5,000 Kenyan shillings a month. In Marsabit County, 21.5% of households made between 5,000 and 10,000 Kenyan shillings a month. In terms of education, only 1.7% (n=7) of people in Kilifi County had a university degree, whereas 3.25% (n=13) of people in Marsabit did. Marsabit had a higher percentage of study participants who finished secondary school (16.25%) compared to Kilifi County (5.11%).

CLTS awareness by Counties

As provided in Figure 1 below, The proportion of study participants unaware of CLTS was higher in Marsabit, 23%, compared to those in Kilifi where 1.95% of the study respondents were unaware of CLTS. Among those fully conversant with CLTS, 98% resided in Kilifi County; 77% in Marsabit were fully aware of CLTS.

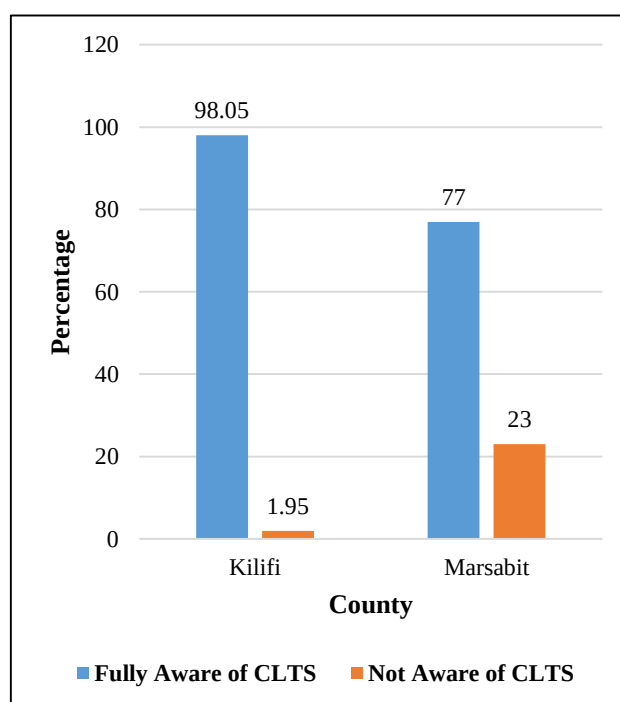


Figure 1: CLTS awareness by counties.

Table 1: Socio-demographic characteristics.

Variables	Kilifi, N (%)	Marsabit, N (%)
Gender		
Female	304 (73.97)	243 (60.75)
Male	107 (26.03)	157 (39.25)
Total	411 (100)	400 (100)
Marital status		
Divorced	16 (3.9)	12 (3.0)
Married	333 (81)	286 (71.5)
Widowed	38 (9.3)	33 (8.3)
Religion		
Christian	286 (69.76)	147 (37.00)
Islam	110 (26.83)	247 (61.75)
Other	15 (3.41)	5 (1.25)
Total	411 (100)	400 (100)
Monthly income (in KSh)		
10,001-15,000	38 (9.25)	64 (16.0)
15,001-20,000	35 (8.52)	34 (8.5)
25001-30000	14 (3.41)	10 (2.5)
5001-10000	69 (16.79)	86 (21.5)
Above-30000	3 (0.73)	22 (5.5)
<5,000	233 (56.69)	160 (40)
Total	411 (100)	400 (100)
Education level		
College	26 (6.33)	34 (8.5)
Primary complete	129 (31.39)	47 (11.75)
Primary incomplete	174 (42.34)	193 (48.25)
Secondary complete	54 (13.14)	65 (16.25)
Secondary incomplete	21 (5.11)	48 (12.00)
University	7 (1.70)	13 (3.25)
Total	411 (100)	400 (100)
Age group (in years)		
21-30	82 (19.95)	157 (39.25)
31-40	98 (23.84)	126 (31.50)
41-50	100 (24.33)	61 (15.25)
51-60	54 (13.14)	26 (6.50)
Above 61	77 (18.74)	30 (7.50)
Total	411 (100)	400 (100)

Level of awareness on CLTS by counties

Table 2 below provides descriptive statistics on the level of awareness of CLTS by counties. As indicated in the table below only a few (12.3%) of the study respondents were not aware of CLTS while the majority (87.7%) of the study respondents were fully aware of CLTS.

Table 2: Level of awareness on CLTS by counties.

Awareness	N	Valid percentage (%)
Not aware of CLTS	100	12.3
Fully aware of CLTS	711	87.7
Total	811	100

Impact of CLTS intervention on sanitation status

The results in this section demonstrate the impact of CLTS intervention programs on sanitation levels in Kilifi and Marsabit counties. PSM analysis was used to evaluate the impact of CLTS intervention on sanitation status in Kilifi and Marsabit Counties. This technique was adopted to eliminate the effect of confounders.

To estimate the average treatment effect (ATT), study participants in the two counties were matched based on propensity scores. The ATT was used to determine the impact of CLTS intervention.

Table 3 illustrates that the ATT difference was 0.0344. This implies that the intervention resulted in a 42% increase in households owning a sanitation facility. By confirming the positive impact that CLTS programs have on ownership of sanitation facilities, the PSM analysis demonstrates that CLTS programs impact sanitation status in Kilifi and Marsabit significantly.

However, the analysis showed a lack of statistical significance ($t=0.42$, $p=0.0835$), implying that the possibility of the occurrence being out of chance was higher.

Table 3: PSM.

Variables	Sample	Treated	Controls	Difference	S.E.	T-stat	P value
Type of sanitation	Matched	0.4496	0.5242	-0.0746	0.0362	2.06	0.0835
	ATT	0.4699	0.4355	0.0344	0.0813	0.42	

DISCUSSION

From this study, a positive reception to CLTS in Kenya was noted. CLTS appears to have significantly influenced the adoption of improved sanitation behaviors. In this study the level of awareness of CLTS in both counties was high. Leveraging community leadership, including

traditional chiefs and village headmen, is a powerful tool for encouraging communities to embrace CLTS program and mobilize to construct and use toilets.¹¹ Marsabit and Kilifi county governments have established an advocacy strategy that uses seven national advocates who are all chiefs with verified ODF chiefdoms. Findings from this

study were concurrent with those of two other studies done in Kenya and Mozambique.^{12,13}

The results from this study demonstrated the impact of CLTS intervention programs on sanitation levels in Kilifi and Marsabit counties. One of the primary goals of CLTS is the complete eradication of open defecation. Evidence from various countries shows that CLTS has successfully reduced open defecation rates, contributing to improved hygiene and overall health outcomes in communities.¹⁴ The participatory nature of the approach empowers communities to take collective action, often leading to sustained behavior changes.¹⁵ Numerous emotive factors, including shame and disgust, hierarchical and peer pressures, and competition (both internal at the village level and external with other communities), influence the behavior change process.

This study demonstrated the strength of CLTS lies in the awareness of its community-based approach in which residents reach their conclusions about the importance of sanitation and develop their strategies for implementing changes based on personal cultural beliefs and practices. Similar results have also been documented in other studies where CLTS awareness has been shown to influence the level of sanitation based on cultural beliefs and practices.^{16,17}

Limitations

The study focused on Kilifi and Marsabit counties, which may have unique socio-cultural, economic, and environmental conditions that are not representative of other regions in Kenya or other countries. The findings may not be applicable to areas with different contexts. The awareness of CLTS can vary significantly depending on how the program is implemented, including the quality of training, community engagement, follow-up, and monitoring.

CONCLUSION

The study established that the level of awareness of CLTS in both counties was high. Engaging community members through participatory approaches, such as discussions, group activities, and community-led mapping of open defecation areas, can enhance awareness. In addition, leveraging community leadership, including traditional chiefs and village headmen, is a powerful tool for encouraging communities to embrace the CLTS program and mobilize to construct and use toilets. The results from this study demonstrated that CLTS intervention programs had an impact on sanitation levels in Kilifi and Marsabit counties.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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