

Community Led Total Sanitation to Reduce Household Diarrhea Morbidity in Nyando District

Wanzala Maximila¹ Makotsi Nicholas²

1. Masinde Muliro University of Science & Technology P.O Box 190-50100, Kakamega

2. Nyando sub county public health officer

Abstract

Community-led total sanitation (CLTS) is an innovative way to achieve communities free from open defecation. The purpose of the study was to show the association between CLTS and the Reduced Household Morbidity in the whole of Nyando District. The study was a comparative cross sectional study and was carried out in Nyando Sub County. Overall 47.3% of household members still defecated in the open the previous day (6.7% in intervention site compared to 74.6% in the control site, $p < 0.0001$), and a two week prevalence of diarrhea was 17.4% (11.1% in the intervention site compared to 21.6% in control site).

1. Introduction

Sanitation remains one of the biggest development challenges in developing countries. Around 6,000 people, mainly children under five, die every day due to poor sanitation, hygiene and water. Sanitation-related diseases such as diarrhea and cholera continue to seriously undermine human health and well-being. Improving sanitation is therefore key to achieving the health-related Millennium Development Goals (MDGs) of reducing child mortality and combating disease. (Bongartz P. 2008). Decades of large-scale programs imposed from outside the local context have failed to change these practices.

Community-led total sanitation (CLTS) is an innovative way to achieve communities free from open defecation. It changes people's behavior by shifting mindsets to focus their desire for, and triggering them to build a sanitation system themselves. CLTS emerged in Bangladesh in early 2000s. Developed by Dr Kamal Kar, (Kar 2008) it is a participatory answer to traditionally subsidized sanitation programs that have not succeeded in getting people to want, build, pay for, and use latrines (Kar 2003). The approach promotes 100% open defecation free communities to minimize the risk of contamination for all, breaking the cycle of fecal-oral contamination. Contrary to most conventional sanitation approaches which aim simply at providing toilets (PV Otieno 2010 a, PV Otieno 2010c), CLTS aims to promote collective behavior change as the key to sustainable, improved sanitation (WSSCC 2012).

An estimated 2.5 billion people worldwide lack proper sanitation, most living in sub-Saharan Africa and Asia. Globally, this amounts to 1 in 3 people not having a toilet and about 1.1 billion practicing open defecation (Plan 2012). 949 millions of these open defecators live in the rural areas (WHO/UNICEF, 2012). Community led total sanitation (CLTS) which seeks to address this problem, began in Bangladesh in 1999, and spread rapidly across Asia, Africa, the Middle East and Latin America and is now being implemented in over 20 countries in Africa. (Mehta L, 2009). Whereas sanitation is one of the biggest development challenges in developing countries; it is also acknowledged that its improvement is the key to achieving the health-related Millennium Development Goals (MDGs) of reducing child mortality and combating disease.

The CLTS uptake and Implementation in Africa was introduced in 2006, CLTS began to go to scale in Africa in around 2009. Since introduction CLTS has spread magnificently and is now used in at least 34 African countries with hundreds of thousands of communities gaining Open Defecation Free (ODF) status through collective local action without external hardware subsidy. It has spread in 34 African countries in just over 4 Years, 15 countries in Eastern and Southern Africa, 19 countries in West and Central Africa. CLTS has been in cooperated in the National Sanitation strategies in 7 countries in Eastern and Southern Africa, and 6 countries in Western and Central Africa (Kar 2011). Today CLTS is in more than 20 countries in Africa including Ethiopia, Tanzania, Kenya, Nigeria, Uganda, Zambia and Sierra Leone. (Mehta L., Bongartz P., 2009, WSP, 2005, Bongartz 2008).

In a study to Evaluate strategies for the scaling up of Community Led Total Sanitation in Ghana, the CLTS process focused on Open Defecation Free (ODF) status in the pilot projects; 60% of the communities visited had attained ODF status. Sanitation practices mostly involved upgrading or repairing the existing communal latrines which was the first priority for most communities. Provision was made for construction of separate communal latrines for men and women. (Joyce M et al 2009).

CLTS was introduced in Kenya in May 2007, after two workshops in Tanzania and Ethiopia attended by Plan Kenya staff (Mehta L. 2009) that later rolled out the approach in 14 districts in the country including Kilifi that led to Jaribuni village of Kilifi District become the first Open Defaction Free (ODF) village by November 2007. Fifty other villages became ODF by 2009 as a result of that triggering. In most of these districts CLTS was identified as a movement with the potential of addressing sanitation and hygiene problems so that by

May 2008, 500 CLTS facilitators had been trained who then went ahead and triggered 200 villages. (Plan Kenya 2011). By 2009 Kilifi had over 200 open defecation free (ODF) villages and the number of latrines had increased from 300 in 2007 to over 4,550 (Bwire 2009).

1.1 Problem statement

More than 80 percent of the cases of diarrhea worldwide are the result of fecal-oral contamination.”(Manisha K et al 2008) and that 30% of Kenya’s disease burden is sanitation-related,(WSP Mission, 2007). Open-field defecation contributes to the spread of disease through the fecal-oral transmission of pathogens (Manisha K et al, 2008).This is the problem that Community-Led Total Sanitation (CLTS) is supposed to eradicate through facilitating the communities to do their own appraisal and analysis, come to their own conclusions, and take their own actions. CLTS has been associated with disease reduction in many countries but to date no rigorous study has been conducted to evaluate the impact or association of CLTS on the disease morbidity, despite the worldwide acclaim which CLTS has received. (Chummy S. S et al 2012).With the inception of CLTS in Kenya in 2007, the Ministry of Public Health and Sanitation, targeted to achieve an open defecation free Kenya by 2013 (Unicef 2012, Mugo 2011).This target correlates with data from Nyando district health records which indicates a steady decline in diarrheal cases from 34, 551 in 2008 to 4,962 in 2011 (86%). However, no study has been done to show the association between Community Led Total Sanitation (CLTS) and the Reduced Household Morbidity in the whole of Nyando District. This is why this study was conceived.

1.2 Broad objective

To investigate the association between CLTS and reduced diarrhea morbidity amongst households in Nyando District

1.2.1 Specific objectives

1. To establish the level of uptake of community-led total sanitation amongst households in Kochogo Central and Wanganga sub locations of Nyando District
2. Establish the prevalence of diarrheal among CLTS and non CLTS households in Kochogo and Wanganga sub locations of Nyando District.

2. Research Methodology

2.1 Study design

This study adopted comparative cross sectional study design where data from intervention site was compared to those from a control site. The interventions households were households within Kochogo Central sub location where CLTS had been implemented as a sanitation approach while households from Wanganga sub location where CLTS was not implemented regardless of whether they suffered diarrhea or not were controls. CLTS as an intervention targeted all households living within a particular sub location and all households were considered to be exposed to the intervention while all households in Wanganga sub location where intervention was never implemented were considered as not exposed. During the survey, households were asked if they have experienced diarrhea in the prior two weeks and the number of diarrhea cases experienced in that period. This provided data in both binary and continuous variables for analysis. CLTS was considered a predictor variable to household disease occurrence

2.2 Study Population

The study targeted 888 households in the two sub locations of Wanganga where CLTS was not implemented which had 526 households and Kochogo Central where CLTS was implemented which had a total of 362 according to the KNBS, 2009 Nyando District. The household was the unit of observation and data was collected at the household level.

2.3 Sampling Design

A multi stage cluster sampling technique was used to select one location out of a total of 3 locations that were implementing CLTS and one location of the 3 locations not implementing CLTS. The next level involved random selection of one sub locations out the three that were implementing CLTS and one of the 4 sub locations that were not implementing CLTS to participate in the study.

A systemic sampling technique was then used to select households to participate in the study. A sampling interval of 3 households was calculated based on total number of households in each sub location divide by the required sample size. The random start selected after tossing a pen to identify the direction to start from the center of the clusters. Of the two first households to start, a coin was tossed to pick one of the two. There after every third household was selected to participate in the research in each of the directions east, west, south and north from the center of the clusters. In the intervention sub location of Kochogo Central , 100 households was selected out of 362 and in the control sub location of Wanganga , a total of 145 households were

selected for out of 526 households, The total sample of 245 households was selected out of the total population of 888 households in the two sub locations.

3.1 Results

3.2.1 Key findings of this study were:

The Community Led Total Sanitation (CLTS) Uptake

The CLTS uptake was significantly high in the intervention sites where only 6.7% (6/90) of household heads reported that any members of their households had defecated in the open the previous day compared to 74.6% (100/134) in the control sites ($p < 0.0001$). Overall, 47.3% of household's members still defecate in the open as reported by heads of the households. All (100%) households in the intervention community owned a toilet while only about 37.9% (77/203) households in the control sub location owned toilets. The latrine ownership and use stood at 60.3% (135/224) overall coverage in both the intervention and the control sub locations.

Toilet Ownership

N=224	Overall n (%)	CLTS House holds n (%)	Non CLTS House holds n (%)	P value
Toilet Ownership				
Yes	135(60.3)	90(100.0)	45(33.6)	<0.0001
No	89(39.7)	0(0.0)	89(66.4)	

Prevalence of Diarrhea in Nyando district

During the period of the survey, 237 episodes of diarrhea cases were reported representing 17.4% 2 week prevalence amongst 1367 persons surveyed; only 63 episodes of diarrhea (11.1%) were reported amongst 563 persons in the interventions sites, while 174diarrhea episodes representing 21.6 %of 804 persons were reported in the control areas. The difference were statistically significant ($p=0.042$).

Table 4: Prevalence of Diarrhea in Nyando district

	Number of households	Number of persons	Diarrhea episodes	% prevalence	P value
Kochogo Central	90	563	63	11.1	0.042
Wanganga	134	804	174	21.6	
Total	224	1367	237	17.4	

5.1 Uptake of Community-Led Total Sanitation amongst households

Uptake of CLTS was significantly high in the intervention sites which reported almost nil members of their households defecating in the open as compared to the control sites. Overall some household's members still defecate in the open as reported by heads of the households especially from the control sites. These findings demonstrate that overall uptake still lower than the expected. However, intervention sites where CLTS was implemented there was high level of knowledge on indicators of CLTS and uptake. These findings are consistent with the findings of a study carried out in Indonesia on Improving CLTS from a Community Perspective Approach, which found that CLTS results were also primarily recognized and seen in terms of 100% toilet coverage than the end of open defecation both by the communities and implementing agencies at the district level. Hundred per cent toilet coverage and end of open defecation are almost universally assumed to be directly linked for recognizing ODF communities and recommending them for their formal recognition as ODF villages by the district administration. In Sumedang village, 80% toilet coverage is reported to be considered good enough for claiming open defecation free (ODF) status for the villages, in many cases. In the case of MuaraEnim village, less than 100% toilet coverage coupled with sharing of toilets but with no open defecation has been largely the criteria for declaring a village ODF, which is closer to the CLTS approach and methodology. In Lembata village, 100% toilet coverage is the minimum criterion for declaring a village ODF, but not necessarily on the basis of actual verification of the ODF status of the village concerned. (Nisheeth K *et al* 2012).

5.2 Prevalence of Diarrhea in CLTS and non CLTS Households

The study has established that the overall two week prevalence of diarrhea in the study area was 17.4%. The comparison between prevalence of diarrhea between CLTS and Non CLTS indicated that households in CLTS intervention areas experienced less diarrhea compared to households in the control site. This difference of was statistically significant. A previous study in Turkana District, Kenya, found out that overall, prevalence of diarrhea related microbes in children aged <5 years reduced from 91.3 % in 2007 to 78.3 % after intervention (2008). Quick et al also reported that during a five-week baseline survey, the prevalence was 6.4% in the intervention compared to 6.7% in the control sites (Quick, 2002). This study was restricted to number of diarrhea episodes children under 5 for a five week survey period. In another study done in Nyando, Diarrheal disease was found to be a major cause of morbidity and mortality among under-fives especially in rural and peri-urban

communities in the District. It found out that diarrhea contributed to 87. % and 48% of child morbidity and mortality respectively. (Othero et al 2008).

Recommendation

1. For Policy- The study would recommend that CLTS be rolled out in all the rural and urban areas in Kenya since it has shown a significant reduction of sanitation related diseases so that Kenya can not only be able to meet its MDG goals, vision 2030 but also be able to meet its goal of achieving an ODF Kenya by 2013
2. For Practice –The study recommends that communities should be encouraged to harness their inherent potential through small doable actions such as CLTS has demonstrated so as to realize maximum benefits through their own initiatives.
3. For further research. A randomized trial to follow households and observe incidence of household morbidity

Conclusion

Uptake of community led total sanitation in the study areas at 52.2% is still lower than the expected 100%. Households living in the intervention sites where CLTS was implemented were more aware of CLTS as opposed to areas where it was never implemented. The result has also revealed that all households in the intervention had sought local solutions and had also used local materials to construct toilets compared to control sites.

The Overall two week prevalence of diarrhea was significantly lower in the intervention sites compared to control sites. Where CLTS was implemented fewer episodes of diarrhea were reported compared to sites where CLTS was never implemented. Households in the intervention sites were more likely to participate in community led total sanitation program compared to those in the control sites. Similarly all, households who resided in the intervention sites sought local solutions to sanitation problems compared to those from control sites.

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