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EFFECTS OF IMPROVING SANITATION THROUGH COMMUNITY LED SANITATION APPROACH IN PREVENTING DISEASES IN RURAL COMMUNITIES

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ABSTRACT

In recent years there has been heightened adoption of CLTS approach to improve community sanitation in order to prevent or reduce diseases. This review article examines the effects of uplifting sanitation by way of community led sanitation (CLTS) methodology in addressing prevention and reduction of sanitation and hygiene related diseases in rural communities, especially in developing countries. Systematic review was performed by searching existing literature. Several articles were retrieved for this purpose. Most articles reviewed reported aspects of prevention and reduction of sanitation related diseases by improving sanitation through implementation of CLTS implying that it's an effective approach. Further research is needed to compare effects of improving sanitation using other approaches or technologies in preventing or reducing diseases associated with low or poor sanitation. This will contribute to identifying cost-effective approaches for delivery of essential package of sanitation for promoting health and preventing diseases.

Keywords: Sanitation, Hygiene, Community Led Total Sanitation, Disease Prevention

1. INTRODUCTION

Improvement in sanitation is arguable one of the key cost effective ways of preventing and reducing morbidity associated with poor sanitation and hygiene. Evidence available point to a significant rate of return for every dollar invested as improved sanitation contribute to rapid development leading to provision of high quality of life to people, free from sanitation related diseases and other maladies WB-WSP (2013). Some consequences of poor sanitation include diarrhea and diarrheal related diseases sometimes leading to death especially in young children, stunting caused by chronic childhood exposure to fecal germs, premature death, and

productivity losses as well as poor general health and well-being Kenya National Bureau of Statistics (2009). Moreover, the burden of disease and mortality as well as economic loses are enormous. For instance, Kenya loses about US$ 365 Million annually equivalent to 1% of GDP WB-WSP (2013), Kenya Personal communication (2021). Despite these immense problems and loses, many areas in many countries, sanitation coverage as measured by latrine ownership and usage is quite low.

Many households are still practicing open defecation due to lack of simple latrines; thus, this is a source and spread of sanitation related diseases which account for about 50% of total morbidity as well as other health maladies afflicting people. In reality, however, the short- and long-term health problems attributed to poor sanitation could bigger than depicted here.

This unsanitary situation in Kenya as well as many developing countries exists in appalling manner. Data indicate that nearly 21.5 million people use unsanitary or shared toilets, while approximately 5.7 million do not use latrines indicating that they defecate in the open Kenya National Bureau of Statistics (2009). Moreover, 17,000 children in Kenya below five years lose their lives each year from diarrheal diseases, about 90 % of which is caused by unsafe water and sanitation as well as poor hygiene Kenya National Bureau of Statistics (2009). This negates achievement of United Nations sustainable development goals.

As a result of poor sanitation, Governments and various non-governmental organizations have been undertaking various programmes, projects and interventions aimed at uplifting sanitation levels. The agency, Community Water and Sanitation (CWSA), Plan International, and UNICEF as well as Water Aid have been implementing community led sanitation starting from 2007 in about 240 communities in Ghana. This was in an effort to enhance hygiene and sanitation. Most of the sanitation activities were in the Northern, Upper West, Eastern, Central and Accra areas. These organizations started pilot activities and adopted varied institutional arrangements for implementation. The facilitators were from different local government agencies and NGOs. Owing to failure of previous approaches, this new one was necessary for sanitation improvements.

Sanitation entails clean environment conditions and safe disposal of wastes including human wastes Venkataramanan et al. (2018). Besides human contact with wastes and hand washing with soap properly is part of good sanitation. Thus, sanitation systems focus on safeguarding human health by providing safe environment that will prevent transmission of pathogenic organisms, particularly via the oral route Sanitation (2017). An example in this case is diarrhoea. Diarrhoea is considered as the main cause of malnutrition which leads to slowed or stunted growth among young children,yet it can be prevented or controlled by ensuring availability of adequate sanitation Susan (2008). Its worthy noting that there are also numerous other sanitation related diseases transmitted owing to inadequate sanitation and hygiene. Such diseases include worm infections, cholera, hepatitis, trachoma, schistosomiasis, polio etc.

There are several sanitation technologies and approaches of addressing sanitation problems in rural communities. Some of which include community sanitation, ecological sanitation, sanitation in emergency situations, environmental sanitation, on-site sanitation as well as sustainable sanitation. Other methodologies include participatory hygiene and sanitation transformations (PHAST). All these technologies go a long way in enhancing sanitation and hygiene in communities. In this article, focus is on community-led sanitation approach which was adopted recently as a way of improving sanitation in rural communities especially in developing countries plagued with poor sanitation.

This methodology of improving sanitation essentially aims at changing people's behavior mainly in rural areas through a triggering process, which leads to quick adoption of non- open defecation practices. Thus, it focuses on spontaneous and sustained behavior change of the entire community. The CLTS triggering implementation process entails ways of stimulating community action in ending defecation in open, by constructing simple usable toilets. Thus, CLTS actions lead to increased self-respect and pride in a community Venkataramanan et al. (2018). Furthermore, it aims at instilling disgust and embarrassment about one's own shameful open defecation behaviours Venkataramanan et al. (2018). Thus, CLTS basically aid in improving sanitation in rural areas without giving subsidies. Besides it facilitates communities to appreciate problem of defecating in open places and thus act collectively in making people adopt non-open defecation practices crucial in preventing diseases.

2. METHODS

Key objective of this study was to review articles to find out how improved sanitation addresses or affects sanitation and hygiene related diseases. Hence research questions framed were 1) What is the magnitude of sanitation problem, 2) How does CLTS approach address sanitation problems in rural communities? and 3) What are effects of improved sanitation through CLTS approach in reducing sanitation and hygiene related diseases?

Internet search through Boolean queries were conducted to published articles especially those relating to sanitation and sanitation related diseases and have one of the following expressions in their titles, abstracts, or keywords: 'sanitation', and 'community led sanitation', or sanitation related diseases. The internet databases were the main resources of search. The literature review was performed in January 2022. All the articles that report evidence in the context of linkage of sanitation and diseases were included. In exclusion criteria, articles excluded were those not published in English. After excluding the articles which do not meet the criteria, the remaining articles were selected by following 1) all abstracts were assessed for relevance and those clearly outside of this review were eliminated; 2) then, the abstracts of the articles retrieved were assessed to find if they were related to improving sanitation and reducing diseases, and those articles reporting studies not related to this were excluded; 3) thereafter, the remaining abstracts of 21 articles were assessed in accordance with inclusion and exclusion criteria; and iv) the text of retrieved articles was reviewed fully.

3. RESULTS

The guidelines of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) were used for systematic review Moher et al. (2009). In total 2108 articles were obtained from initial search in internet Web. In the initial screening 48 articles without abstracts were removed leaving 2060 articles for further screening. In second screening 1 676 articles were eliminated owing to 1) they were not written in English (11 articles); 2) were overviews or systematic revisions; 3) were brief overview articles and workshops reports; and iv) are not related to improvement of sanitation. In step 3 the remaining 384 articles abstracts were analyzed and 384 articles were found to be related to sanitation. In step 4 of abstract screening, out of 384 articles, 137 were excluded for not being specifically related to improvement of sanitation using CLTS approach, and 230 articles were excluded for not being related to reduction of sanitation related diseases. The

remaining 24 articles were considered eligible for systematic full review screening. Thus, a total of 24 Articles underwent full text review.

4. DISCUSSION

4.1. PROBLEMS OF SANITATION

Poor sanitation attributed to non-use of toilets, unhealthy behaviors, use of water not safe, and indiscriminate disposal of wastes are common in many countries in South Asia, Africa, and Latin America. Apart from causing diseases, they degrade environment adversely affecting health and lives of many people, particularly poor and most vulnerable people in aforementioned parts of the world. Moreover, many parts of Southeast Asia, the unsanitary situation is widespread, and a number of people suffer from diseases attributed to inadequate safe drinking water, inadequate sanitation facilities and low hygienic practices (VERC, 2002(7).

Moreover, in some parts of Bangladesh, many people in rural and urban areas practice unhealthy defecation. The said practices, aggravated by lack of hygienic behavior, contaminate drinking sources of drinking water as well as the environment including water bodies and crop land. Studies have shown that these practices lead to the spread of diseases such as diarrhea, typhoid, and can also cause epidemics of cholera disease Village Educational Resource Centre (VERC) (2002).

Some international development agencies such as UNICEF, United Nations Development Programmes (UNDP), and World Bank have spent enormous resources in countries of Asia, Africa, and Latin America on sanitation programmes. Besides, some national and international NGOs are working on water and sanitation with support from donor agencies. Most agencies working to upscale sanitation spend resources on motivating people to construct latrines and provide subsidies at varying levels. It is reported that in Bangladesh, hundreds of NGOs were engaged in sanitation activities but after many years of inputs there no significant achievements in improving sanitation and as a result many people are still defecating in the open (8).

Despite NGOs providing subsidies to motivate people to construct latrines to stop open defecation, adoption, and uptake of this has been low WELL (2001).

In the 1990s, Bangladesh had less than 15% latrine coverage BBS (1996) in spite of many international agencies and NGOs implementing environmental sanitation improvements by constructing latrines with provision of subsidies Kar et al. (1998). This gave rise to innovative approach of community led total sanitation (CLTS) pioneered by Kamal Kar, in collaboration with Village Education Resource Centre (VERC), Water Aid in Bangladesh and other organizations Bajrachanja et al. (1998). This initiative was aimed at empowering communities to analyze the extent and risk of environmental contamination attributed to indiscriminate disposal of human wastes and unhygienic practices. Thus, this triggered local communities to change their poor hygiene practices and consequently construct and utilize latrines without any external assistance Bajrachanja et al. (1998). This initiative had a huge impact in improving sanitation in many areas with data indicating that households accessing latrines increased from 15% to nearly 80% Bangladesh Bureau of Statistics (2005). The initiative also changed communities' attention from counting latrines constructed to behavior modification, that's ending open defecation, safe solid waste disposal, and unsafe domestic water use.

In an effort to tackle sanitation problems, many people worldwide benefitted from CLTS that led to increases in latrine coverage and use in many rural

communities thus contributing to controlling and reducing diseases Venkataramanan et al. (2018). Many villages were thus declared as "ODF villages".

Its worth noting that besides up scaling sanitation by way of CLTS, hygiene through proper hand washing practices as well as safe water availability are crucial pillars in preventing diseases.

4.2. SANITATION AND DISEASE PREVENTION

Knowing the connection between sanitation and disease is crucial in designing disease prevention and control interventions. Furthermore, there is a relationship between improved sanitation and disease prevention. For instance, poor personal hygiene leads to increased cases of diarrhea Huttley et al. (2001). Furthermore, connection between hygiene practices and health been shown in other studies elsewhere. For instance, a study done in Congo, demonstrated reduction of 11% in the incidence of diarrheal diseases particularly in communities where personal hygienic practices were enhanced Ashworth et al. (2002).

Fecal contamination of hands has also been associated with transmission of disease-causing germs. A study in Honduras showed feacal contamination on 44% of the fingertips of women tested during normal domestic cores Trevett (2003). Similar findings have also been reported where pathogenic enterotoxigenic Escherichia coli (ETEC) was detected from mothers and children's hands in Thailand study Esrey et al. (1991). Other studies have further demonstrated decrease of 64% of diarrheal diseases in places where sanitation standards including hand washing were improved Esrey et al. (1991). This underscores the importance of promoting proper hand washing at all critical times as it's a key "weapon" in controlling diseases.

Some studies have demonstrated that CLTS implementation can also reduce stunting in children. For instance, a cluster randomized controlled trial in rural Mali done in 2011 to 2013 showed that CLTS substantially increased child growth (thereby reducing stunting), especially in children below two years Venkataramanan et al. (2018).

4.3. WATER AND DISEASE PREVENTION

Understanding relationship of water disease is paramount in designing prevention strategies. Availability of safe water supplies are crucial in drinking and hand washing as deficit leads to transmission of water borne diseases which cause immense suffering and sometimes even death. It's apparent that children are more vulnerable to diseases associated with contaminated water as well as poor sanitation Curtis and Caincross (2003). A comparative study on differentials of child health in urban areas of Brazil, Egypt, Ghana, and Thailand showed that environmental factors such as drinking water sources, improvement of sanitation and hygiene as well as housing conditions are associated with prevention of childhood diarrhoea Curtis and Caincross (2003). Another study from the republic of Congo revealed that children coming from households that obtain water from protected sources were less likely to experience attacks of Diarrhea Disease (2017).

4.4. COMMUNITY LED TOTAL SANITATION IN AFRICA

The community Led Sanitation, the most recent sanitation technologies, was initiated by Water Aid and its collaborators starting with 4 communities in Benue state in Nigeria in 2004 Water Aid Ghana (2007). After the piloting, the project was

implemented by Water Aid and its local NGO collaborators in much wider scale. The results showed significant increase in latrines constructed and there was considerable improvement in hygienic practices in communities.

Subsequently Water Aid conducted an internal evaluation of the pilot project in 2006 in which it showed the project was successful Water Aid Ghana (2007). The evaluation also revealed significant improvement in community environmental sanitation, enhanced personal hygiene, and use of safe water, as well as safe solid waste disposal. Additionally, there was a sense of empowerment amongst the community members Water Aid Ghana (2007).

Another evaluation in Ghana revealed that CLTS projects led to significant sanitation improvements in over 250 communities. About 60% of the communities' use latrines, their environment was clean with well-maintained refuse pits, while some people had hand washing facilities with soap outside the latrines Magala and Roberts (2009). Moreover, a case-control study in Ghana revealed that mothers with children less than five years and with no access to latrines had an odds ratio of 17.5 on diarrheal morbidity compared to those who had access to latrines. In other words, the former was more likely to suffer from diarrheal diseases. Another Zimbabwe case control study revealed that diarrheal morbidity among school children was lower by 68% in communities that had latrines than in communities that had not implying that use of latrines is crucial in communities.

4.5. HAND WASHING AND DISEASE PREVENTION

Hand washing is a key component of sanitation. Thus, besides providing proper sanitation, hand washing is also crucial in preventing diseases. Studies have shown evidence on the importance of hygiene practices, particularly hand washing with soap which has been associated with nearly 50% reduction in incidences of diarrheal Curtis and Caincross (2003). Moreover, good hygiene practices enhance overall health through reduction in pneumonia, scabies, skin and eye infections, and influenza cases. This means communities that have poor hygiene practices have higher risk of contracting water and sanitation related diseases. These diseases can impact negatively on health and nutrition of young children UNICEF (2009). Hence the incessant need to focus on their prevention through improved sanitation and hygiene.

Implementation of community led total sanitation has been adopted in many developing countries and here I will briefly look at Kenya as an example, since it is a developing country.

4.6. COMMUNITY LED TOTAL SANITATION IN KENYA

In Kenya CLTS was introduced in 2007 Ministry of Health (MoH) (2017). This approach has become a movement that has great potential in tackling sanitation and hygiene challenges in rural communities. Many areas which have undergone CLTS implementation have shown tremendous positive changes in hygiene improvement. They were triggered by facilitators while others took own interest and self-initiative owing to influence of natural leaders and committed community members from neighbouring CLTS villages Plan Kenya (2009).

The uptake of CLTS implementation in Kenya has been slow. For instance, despite 51% of villages having CLTS partnership, only 22% of villages have been triggered to adopt CLTS uptake (22). Besides many rural households (about 30%) have no access to sanitary facilities, and hence many people (about 5.6

million) practice open defecation Kenya National Bureau of Statistics (2009). This could be as a consequence of various factors including firm cultural beliefs which relate to latrine use. For instance, most communities in Kenya erroneously believe feces of young children are not injurious hence they are not disposed safely. And here lies the salient danger of transmitting diseases among the communities.

It's vital to unequivocally state that research has shown overwhelming evidence that sanitation and hygiene outcomes were better in the CLTS intervention areas than in the non-CLTS intervention ones Pickering et al. (2015), Diarrhea Disease (2017). This suggests that scaling up CLTS could reduce ODF and the burden of diarrheal diseases. Thus, disposing fecal matter safely by achieving ODF claim status in all communities in order to stop defecating in the open using toilets is paramount.

Consequently, there has been tremendous reduction of sanitation and hygiene related diseases owing to implementation of community led total sanitation coupled with enhanced hand washing Kenya Personal Communication (2021), Freeman et al. (2012) as well as improved hygiene Pruss-Ustun et al. (2008), Roberts et al. (2001) and safe water Shahid et al. (1996), Roberts et al. (2001). Besides preventing diseases, improving sanitation and hygiene as well as providing safe water goes a long in promoting health and well-being of people.

This review has revealed considerable evidence that CLTS approach if implemented well is a key "driver" to enhancing sanitation and hygiene in rural communities. Nonetheless more diverse research is needed to compare effectiveness of various sanitation interventions/approaches in preventing and reducing sanitation and hygiene related diseases. These will likely lead cost effective interventions for tackling sanitation conundrums in communities and hence accelerate delivery of essential package of sanitation comprised of safe human wastes disposal, hand washing and safe water for promoting health and preventing diseases.

CONFLICT OF INTERESTS

None.

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