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Effective Methods for Community Sanitation and Hygiene Promotion in the Developing World: A Scoping Review

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Abstract

World Health Organization data on the burden of disease shows that approximately 3.1% of deaths (1.7 million) and 3.7% (54.2 million) of disability-adjusted-life-years (DALYs) worldwide are attributable to unsafe water, sanitation and hygiene. In Africa and developing countries in South East Asia 4 - 8% of all disease burdens are attributable to poor hygiene and sanitation. Over 99.8% of all deaths in developing world are attributable to the same factors and 90% are deaths of children under five years. Studies have shown that more than 2 billion people lack access to adequate sanitation and hygiene and increased access to sanitation and better hygienic practices have significant positive health and other impacts. The aim of this study was to search, document and provide a synthesis of effective methods used in promoting hygiene and sanitation in communities across the developing world. This was a scoping review. A total of 42 evaluation surveys were reviewed. Data was collected from 8 out of 42 papers which met the inclusion criteria to be considered into the dataset. Results indicated that social mobilization and community participation methods which include; Community Led Total Sanitation (CLTS), Participatory Hygiene and Sanitation Transformation (PHAST) are effective methods in promoting community hygiene and sanitation. Though Children's Hygiene and Sanitation Training (CHAST) and Sanitation marketing have been implemented to improve hygiene and sanitation, currently no evaluation studies have been conducted to evaluate effectiveness of these approaches. To achieve access to adequate sanitation and hygiene for all, and to end open defecation and reduce burden of diarrheal diseases by the year 2030 (Target 6.2 of the Sustainable Development Goals), governments and development agencies working in the developing world need to fast track adoption and scaling up of CLTS and PHAST. CHAST and sanitation marketing strategies should also be embraced because they are grounded on sound scientific principles and have potential to improve hygiene and sanitation. However, there is need to carry out evaluation surveys to measure their effectiveness in improving sanitation and hygiene in the developing world.

Key words: *Hygiene, sanitation promotion, CLTS, PHAST, CHAST*

Introduction

Sanitation defined in its broadest terms indicates the safe collection, storage, treatment and disposal/re-use/recycling of human excreta (faeces and urine), the management/re-use/recycling of solid waste (rubbish), the collection and

management of industrial waste products, and the management of hazardous wastes (including hospital wastes, chemical/radio-active and other dangerous substances). World Health Organization (WHO) defines sanitation as the provision of facilities and services for the safe management of human excreta from the toilet to containment and storage and treatment onsite or conveyance, treatment and eventual safe end use or disposal. More broadly sanitation also included the safe management of solid waste and animal waste. On the other hand, Hygiene promotion is a structured, systematic approach to achieving widespread uptake of hygienic practices (hand hygiene, body hygiene and menstrual hygiene) practices that are likely to limit the transmission of pathogens and parasites (World Bank, 2005). Hygiene refers to maintaining cleanliness of one's body and clothing to preserve overall health and well-being. In the field of public health, hygiene is construed to mean hand and body hygiene. While hand hygiene involves proper handwashing with soap, body hygiene involves not only maintaining general body cleanliness but also proper practice of menstrual hygiene among adolescent girls and women (Budhathoki et al., 2018). Other aspects of hygiene in public health include; water treatment and safe storage, and safe food preparation and handling practices (food hygiene). The focus of community hygiene and sanitation promotion in the developing world has been in promoting construction and utilization of latrines, proper handwashing with soap, and proper management of menstrual hygiene among adolescent girls and women.

Statistics on Universal Sanitation Coverage

In 2017, WHO statistics indicate that 45% of the global population (3.4 billion people) are using a safely managed sanitation service, 31% of the global population (2.4 billion people) used private sanitation facilities connected to sewers from which wastewater is treated, 14% of the global population (1.0 billion people) used toilets or latrines where excreta are disposed of in situ, 74% of the world's population (5.5 billion people) used at least a basic sanitation service. Despite significant gains — over 2.2 billion people gained access to improved toilets or latrines since 1990, WHO data indicates that over 2.0 billion people still do not have basic sanitation facilities such as toilets or latrines and that of these, 673 million still defecate in the open- in street gutters, behind bushes or into open bodies of water.

Statistics on Universal State of Hygiene

In 2015, many high-income countries lacked sufficient data to estimate the population with basic handwashing facilities. Coverage of basic handwashing facilities with soap and water varied from 15 per cent in sub-Saharan Africa to 76 per cent in Western Asia and Northern Africa, In Least Developed Countries, 27 per cent of the population had basic handwashing facilities with soap and water, while 26 per cent had handwashing facilities lacking soap or water. The remaining 47 per cent had no facility. In sub-Saharan Africa, three out of five people with basic handwashing facilities (89 million people) lived in urban areas. (World Health Organization & United Nations Children's Fund, 2017).

Why is Hygiene and Sanitation Promotion Important?

Inadequate sanitation is a major cause of infectious diseases such as cholera, typhoid and dysentery world-wide. It also contributes to stunting and impaired cognitive function and impacts on well-being through school attendance, anxiety and safety with lifelong consequences, especially for women and girls. Globally, unsafe water and poor sanitation and hygiene account for approximately 1.9 million annual deaths and 4.2% of the global burden of disease. Where water and sanitation facilities are inadequate, faecal contamination of drinking water and soil permits transmission of diarrheal pathogens and, according to prior estimates, diarrhea accounts for the largest fraction (> 90%) of the global burden of disease attributable to unsafe water and poor sanitation. In addition, unsafe disposal of human waste can promote the transmission of water- and soil-transmitted helminthic infections. Poorly managed surface water resources can facilitate vector breeding and promote the transmission of vector-borne diseases such as malaria and dengue. The burden of diseases attributable to unsafe water and poor sanitation and hygiene is largely borne by the poorer members of society and the resulting health effects, including impaired child growth and reduced work capacity, are substantial and poverty-reinforcing (Carlton, et al., 2012).

Benefits of improved sanitation extend well beyond reducing the risk of diarrhea. These include; reducing the spread of intestinal worms, schistosomiasis and trachoma, which are neglected tropical diseases that cause suffering of millions, reducing the severity and impact of malnutrition, promoting dignity and boosting safety, particularly among women and girls, promoting school attendance: girls' school attendance is particularly boosted by the provision of separate sanitary facilities; and potential recovery of water, renewable energy and nutrients from faecal waste. A WHO study in 2012 estimated that for every US\$ 1.00 invested in sanitation, there was a return of US\$ 5.50 in lower health costs, more productivity, and fewer premature deaths.

Study Objectives

It is against this background that this paper sought to identify and document the methods and strategies which have been found to be effective in improving hygiene and sanitation in the developing world.

Methods

This was a scoping review. The reviewers used papers published online to gather evidence on effective strategies and methods used in improving hygiene and increasing access to adequate sanitation in the developing world. All potential papers were first identified from online sources, downloaded and saved in the Mendeley desktop library. The inclusion criteria were; papers from peer reviewed journals, 2. report (from National Governments, United Nations bodies or any other credible organization), and 3. Grey literature published with the aim of reporting on measured effectiveness of a strategy or method used in promoting hygiene and

sanitation in a country in the developing world. A total of 42 evaluation surveys were reviewed. Data was collected from 8 out of 42 papers which met the inclusion criteria. A standardized data collection form was used to collect data as recommended by Munn et al., (2018) and Pham et al., (2014). The data collection forms are designed to capture the following; title of study, country/countries where data was collected, Methods used, findings, conclusion and strength of evidence in study findings. Strength of evidence was graded by assessing the study limitations (defined as the degree to which the included studies for a given outcome have a likelihood of adequate protection against bias) and how researchers attempted to control for bias as proposed by (Berkman. et al., 2013). The strength of evidence was graded in either of the following scores; high, medium or low.

Findings

Community-Led Total Sanitation (CLTS)

Community-led Total Sanitation (CLTS) was developed in Bangladesh to trigger collective change at the community level using participatory methods to incite disgust at open defecation. In this intervention, communities are expected to build sanitation facilities on their own using locally available materials in order to be declared as open defecation-free (ODF) (Venkataramanan et al., 2017). CLTS is the most widely used. It is present in at least 53 countries spreading from Bangladesh where it was started, to South and Southeast Asia, Latin America, the Caribbean, and Sub-Saharan Africa (Venkataramanan et al., 2017). A study conducted in Ghana established that CLTS was sustainable and strengthened previous recommendations that indicated that CLTS was not appropriate in all settings and should be combined with efforts to address barriers households faced in building higher quality latrines (Crocker, Saywell, & Bartram, 2017). A Mixed-Methods Systematic Review of Evidence and Quality of service provided under CLTS program revealed that Fourteen quantitative CLTS evaluations reported decreases in open defecation. The study however indicated that the evidence base on CLTS effectiveness available to practitioners, policy makers, and program managers to inform their actions is weak (Vidya Venkataramanan, Jonny Crocker, Andrew Karon, & Jamie Bartram, 2018). Another study conducted in Nigeria indicates that CLTS is more effective in communities where it is used as the only approach to promoting hygiene and sanitation. The study however revealed that CLTS was not particularly effective in communities that had been influenced by the subsidy approach (Water AID, 2007). In rural Mali CLTS campaign was found to be highly successful in increasing access to private latrines, improving quality of latrines, and reducing self-reported open defecation. Children too young to use latrines were also more likely to use a child potty in CLTS villages (Alzua, et al., 2015). In Ethiopia, CLTS increased the extent of latrine ownership and decreased practice of open defecation. Study also reported intermittent latrine use and poor hygienic practices were reported (Tessema, 2017).

Participatory Hygiene and Sanitation Transformation (PHAST)

PHAST stands for Participatory Hygiene and Sanitation Transformation. It is an innovative approach designed to promote hygiene behaviors, sanitation improvements and community management of water and sanitation facilities using specifically developed participatory techniques (World Health Organization, 2000, & Venkataramanan et al., 2017). PHAST is unique because the underlying basis for the approach is that no lasting change in people’s behavior will occur without understanding and believing in it. The approach involved participation of community groups in a way in which groups planned ways to improve hygiene behaviors in the community, and to build or improve facilities and they made plans for operation and maintenance of facilities (World Health Organization, 2000). The initiative laid the ground work for communities to take their own development forward. It was developed by the World Bank and the World Health Organization (WHO) in the early 1990s, it comprises a seven-step process which include; identifying and analyzing a problem, planning solutions, selecting options, constructing facilities, promoting behavior change, monitoring and evaluating activities, and conducting a participatory evaluation (Venkataramanan et al., 2017). The approach was field tested in four African countries: Botswana, Kenya, Uganda and Zimbabwe in both rural and urban areas and the results were very encouraging (World Health Organization, 2000). Table 1 represents a summary of studies conducted to evaluate effectiveness of PHAST interventions on Increasing Access to Sanitation Facilities in Communities Living in Developing World.

Table 1

Effectiveness of PHAST intervention on Increasing Access to Sanitation Facilities in Communities Living in Developing World

Paper Title	Key Results, Conclusion & Author(s)	Evidence Type /Methods Used	Strength of Evidence
Design and implementation of participatory hygiene and sanitation transformation (PHAST) as a strategy to	There was an overall reduction in the prevalence of children infected with helminths after PHAST intervention. Health stakeholders should utilize PHAST approach to sensitize communities on the importance of hygiene to curb soil-transmitted helminth infections. This improvement was attributed to	A Quasi Experiment	Strong

<p>control soil-transmitted helminth infections in Uganda</p>	<p>construction of new latrines and improvement of the old ones in the intervention site (Dumba R, Jb, & Wabwire-Mangen, 2013).</p>		
<p>Participatory Hygiene and Sanitation Transformation (PHAST) in a Remote and Isolated Community in Philippines</p>	<p>Results showed that there was improvement of knowledge on water and sanitation, handwashing practice, household waste practices drinking practices, defecation practices (Almazan, 2014).</p>	<p>Pretest Post test Study</p>	<p>Weak</p>
<p>Report of the Evaluation of the PHAST tool for the promotion hygiene & sanitation</p>	<p>PHAST does have an influence in bringing about hygiene behaviour changes.</p> <p>PHAST empowers and encourages total participation among all stakeholders (UNICEF, Government of Kenya, International Water and Sanitation Centre, NETWAS International, & IRC, 2009).</p>	<p>Cross-sectional Survey (Grey Literature)</p>	<p>Weak</p>

Child Hygiene and Sanitation Training (CHAST)

The CHAST (Children’s Hygiene And Sanitation Training) method is based on the PHAST (Participatory Hygiene and Sanitation Transformation) approach (CARITAS, 2004). This method was developed in rural areas of Somalia. CHAST applies a variety of exercises and educational games to educate children about the direct links between personal hygiene and good health. Based upon the well-established Participatory Hygiene And Sanitation Transformation (PHAST) approach, CHAST uses a variety of exercises and educational games to teach

children aged between five and 12 about the links between personal hygiene and health. The approach is based upon the premise that hygiene practices are largely acquired during childhood – and that it is much easier to change children’s habits than those of adults. CHAST grew out of a series of sessions with schoolchildren in the self-declared republic of Somaliland (north-west Somalia) in the latter half of 2002, during which the exercises and lessons of PHAST were reviewed and adapted to suit the needs and natural understanding of young Somali children (Vreede, 2005) and (CARITAS, 2004). CHAST was developed by CARITAS Switzerland with funding from the European Union. The resulting exercises sought to deliver fundamental hygiene lessons and information in a fun and memorable way – and a way that is conducive to the hygiene-related practices of daily Somali life and traditional Islamic culture. By giving children practical lessons and tips on improving their own cleanliness and hygiene, CHAST aims to create an important channel for delivering these messages directly into local homes. CHAST uses a ‘child-to-child’ approach to encourage children to participate actively in open discussions and, wherever possible, to share their experiences and ideas with their peers. The approach involves specific participatory activities, using visual aids and other tools for community groups to help them discover the faecal–oral contamination routes of disease (Vreede, 2005). Although grey literature provides some information on CHAST as an effective method of promoting hygiene and Sanitation specifically in Somalia, the information is scanty. Peer reviewed papers on effectiveness of CHAST as an intervention are not available online and therefore there is need to conduct objective evaluations aimed at investigating effectiveness of CHAST in promoting adoption of proper hygiene and sanitation practices among children in the developing world.

Market Based Approaches - Sanitation Marketing

Sanitation marketing is an emerging field that applies social and commercial marketing approaches to scale up the supply and demand for improved sanitation facilities. This strategy is based on the premise that although adoption and use of improved sanitation does require changing the knowledge, attitudes, and behaviors of consumers, market-based approaches recognize that inefficiencies in the market pose barriers to behavior change. Households will not buy toilets if they do not have the cash on hand to purchase them, and they will not use toilets that are uncomfortable to use (Devine & Kullmann, 2011). Market based approaches aim to generate community demand for sanitation, but they also stimulate supply by mobilizing the private sector to offer a range of appropriate and affordable products and services. Market-based approaches can be applied to deliver a number of products (such as household, shared, or public toilets, using various designs and materials), services (like installation or waste removal and treatment) and forms of service delivery (free or pay-for-use). UNICEF which has been in the forefront in promoting sanitation marketing, -appreciates the fact that sustainable market for household latrines relies on a strong supply chain, which stretches from raw materials to manufacturing to distribution. Market research is a critical first step in understanding the landscape for local sanitation suppliers; how they procure resources, set prices, and reach consumers; and how their business fits alongside

other sectors (such as housing). Tracing inputs along the supply chain helps identify inefficiencies and barriers to supply. The success of market-based sanitation is often measured by the increases in household latrine purchase, construction, and usage and the changes to the sanitation supply chain (UNICEF, 2013). Though grey literature indicates that sanitation marketing has potential to help increase access to proper sanitation and improve hygienic practices in the developing world, studies measuring effectiveness of this intervention are not available in online journals resources.

Discussion

The key findings in this scoping review indicate that CLTS, PHAST, CHAST and sanitation marketing are effective methods used in promoting proper hygiene and sanitation in the developing world. However, available data indicate that CLTS and PHAST interventions have been evaluated in different countries and there is a strong evidence associating them with increasing access to sanitation facilities (increase in latrine coverage and utilization) and improvement in adopting proper hygiene practices in communities where those interventions have been implemented. This perhaps will explain the reason as to why the two programs are the most preferred in many developing countries. In regard to CHAST, the implementation science behind this intervention has potential in improving adoption to proper hygiene and sanitation practices among children since it adopts methodologies that children can relate with and enjoy at the same time. However, since inception of CHAST in Somalia, there is little evidence to prove that the intervention has been embraced by other countries in the developing world. Similarly, there is no literature indicating effectiveness of CHAST in improving adoption to proper hygiene and sanitation among children. This could be the reason why it is not as popular as CLTS and PHAST in the developing world. Sanitation Marketing is a new approach founded on a sound logical argument that though communities may be willing to adopt proper hygiene and sanitation lack of effective supply of sanitation facilities in the market may hinder them from adopting proper hygiene and sanitation practices. Despite this being a potentially effect solution to poor hygiene and sanitation practices in the developing world, there is no evidence in both grey literature and peer reviewed journals linking sanitation marketing to improved community hygiene and sanitation. This could be perhaps due to the fact that it is the latest approach and evaluation studies are either ongoing or have not yet been initiated.

Conclusion

Scientific literature available in both in grey literature and peer reviewed publications provides strong evidence linking CLTS and PHAST to increased access to sanitation facilities-increased latrine coverage and adoption of proper hygiene practices in communities living in developing world.

This study however did not find any data linking CHAST and Sanitation Marketing to increased access to sanitation facilities and improved hygiene in the developing world despite the fact that those two interventions have potential to improve hygiene and Sanitation.

Recommendations

Based on our findings we recommend the following;

1. To achieve access to adequate sanitation and hygiene for all, and to end open defecation and reduce burden of diarrheal diseases by the year 2030 (Target 6.2 of the Sustainable Development Goals), countries in the developing world should adopt and scale up CLTS and PHAST. Adoption of these interventions will help accelerate meeting hygiene and sanitation related Sustainable Development Goals.
2. Development agencies and governments in developing world need to embrace CHAST and Sanitation Marketing. The concept behind the two interventions is based on strong scientific approach with capacity to improve hygiene and sanitation in developing world.
3. Governments and development agencies need to partner with implementation scientists to evaluate effectiveness of CHAST and sanitation marketing interventions in promoting hygiene and sanitation in the developing world.

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