

Conference Paper

Demand-Driven Approaches Through Community-Based Program to Reduce Open Defecation Behaviors in Two Subvillages of Sukajaya Village in Bogor, West Java, Indonesia

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Abstract

One significant sanitation problem in Indonesia is the high number of individuals practicing open defecation. The village of Sukajaya, located in the Jonggol district of Bogor in West Java, Indonesia, has poor sanitation practices, with only 40% of the population having toilets. A community-based sanitation program is an approach used to change individual hygiene and sanitation habits by involving the entire community. The aim of this study was to determine the effects of demand-driven approach in a community-based sanitation program to improve residents' knowledge and behavior change regarding open defecation. This study used both quantitative and qualitative approaches. The quantitative approach consisted of a quasi-experimental design used to determine the progress of the residents' understanding and habits related to defecation. This study included 42 households from the Iringowo and Cigaruguy subvillages of Sukajaya. A qualitative approach was used to explore the community's needs, beliefs, attitudes, and culture, and the data was collected through focus group discussions in both sub-villages. The results of the quantitative research, analyzed with Wilcoxon signed-rank test, showed that mean of the residents' knowledge about open defecation free was 4.14 (range 1–7) on pretest and increased into 9.88 (range 6–12) after intervention, with p values $(0.001) < \alpha$. The mean of healthy defecation practices scores was 2.79 (range 1–5) on the pretest and 4.52 (range 2–7) after the program, with p values $(0.001) < \alpha$. The results of the qualitative analysis indicated that the residents had increased knowledge of proper defecation habits. Regarding their habits, the residents began adapting the practice of defecating in toilets. In conclusion, demand-driven approach in community-based sanitation programs is quite effective to increase the residents' knowledge and practice about proper defecation practices.

Keywords: community-based sanitation program, open defecation, sanitation

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Received: 21 December 2018
Accepted: 23 January 2019
Published: 28 February 2019

Publishing services provided by
Knowledge E

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Selection and Peer-review under the responsibility of the 3rd IMOPH & the 1st YSSOPH Conference Committee.

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1. Introduction

In 2010, the World Health Organization reported the results of a study conducted by the United Nations International Children's Emergency Fund, which indicated that 1.1 billion people, or approximately 17% of the world's population, still practiced open defecation. Moreover, Indonesia (55%) was ranked second after India (58%) which still practiced open defecation [1]. Various approaches have been used to resolve sanitation disparities by improving the infrastructure in both cities and villages [2]. However, before 2000, little improvement was made to sanitation facilities in remote and rural areas, which have always faced significant challenges in both the construction and distribution of such facilities. In 2001, several villages in Bangladesh attempted to implement a new approach for improving rural sanitation, called community-led total sanitation (CLTS), which has been widely adopted in several countries, including Indonesia. CLTS supports ongoing intervention programs to improve access to sanitation using local materials and designs [3].

CLTS helps communities aware that the behavior of each community member imply to poor sanitation (e.g., open defecation) [4]. The goal of CLTS is to change people's behavior by altering their mindsets to focus on their needs, prompting them to build their own sanitation systems. Contrary to the most conventional sanitation approach, which only provides toilets, CLTS aims to promote behavioral changes and sustain healthy sanitation habits [5]. However, the CLTS framework does not offer predesigned sanitary solutions. Although the facilitators are not supposed to provide specific technological options to rural residents, they have a responsibility to support the communities as they build their facilities by using local technology and relying on local knowledge. Thus, the choice of a particular technology depends on the availability of the materials and funds, as well as the knowledge and skills of a particular community [6].

Unfortunately, the implementation of CLTS in Indonesia has been hindered by several obstacles. Based on their knowledge, skills, and funding levels, some communities assume that they cannot improve their sanitation without a government subsidy. Moreover, many local cultures challenge people to accept a method that forces changes in traditional practices, which contributes to CLTS failure. Innovative approaches are required to organize communities involving in community-based sanitation programs. One of innovative approaches is demand-driven which including arising people's demand for sanitary facilities and providing supply on sanitary facilities. In addition, the approach also drive community to establish a business group for producing a supply of sanitary facilities by themselves.

The village of Sukajaya is located in the Jonggol district of Bogor in West Java, Indonesia. This village has poor sanitation mainly due to the practice of open defecation and a lack of clean toilets. It was reported that out of a population of 4,626, only 40% had latrines and access to clean water [7]. Over the last three years, Sukajaya received financial aid from the district government, which they distributed to several families each year. Those families purchased latrines to build toilets. However, an evaluation showed that the present amount of aid did not significantly change the community

habits; instead, the community became dependent on external aid. However, a demand-driven approach could be expected to change the behavior of the people in this community. Therefore, the aim of this study was to determine the effects of a demand-driven approach through a community-based sanitation program to enhance the residents' knowledge and behavior regarding defecation.

2. Methods

Both quantitative and qualitative approaches were used in this research, with a quasi-experimental design being used for the quantitative approach. The research sample included 42 households in the subvillages of Iringowo and Cigaruguy. The program included several activities, such as the construction of public toilets in each subvillage in order to create demand, conducting health education related to healthy sanitation, and established business groups that supported and supplied village sanitation resources. The community members participated in the construction of the public toilets by shared their resources, such as: human resource (labors to construct the toilets), food and beverages (served to all labors and residents who were in charged to supervise the construction), and certain building materials. In this way, they increased their skills and gained knowledge about constructing toilets with a minimal budget. They also improved their understanding of the function and construction of toilets and sanitation systems.

The health education activities involved members of the local community, the health center staff, and the women from the 42 households. These activities raised the community's awareness about the importance of using toilets for defecation, and the need to construct toilets and sanitation systems in individual houses. The business group that supported the village sanitation project consisted of the men from the 42 households. This group was responsible for supplying the sanitation materials, and its members were trained to create inexpensive toilet molds and latrines.

This study was designed to evaluate the residents' knowledge and behavior before and after the intervention program using nonparametric testing (i.e., statistical analyses). The data was obtained from the 42 sub-village households' responses to questionnaires and interviews.

The qualitative method used in the study adopted a Rapid Assessment Procedures design to explore the knowledge, perceptions, opinions, and sociocultural factors related to defecation in the communities. The qualitative data was collected through focus group discussions conducted before and after the intervention program. The four discussion groups consisted of the people in the community (two groups) and their leaders (two groups). The data was transcribed, and a content analysis was conducted for its interpretation.

3. Results and Discussion

3.1. Quantitative data for the evaluation of the intervention program

As shown in Table 1, there were differences in the knowledge and behavior levels before and after the intervention program. The results of the quantitative analysis using the Wilcoxon signed-rank test showed that the means of the knowledge test scores were 4.14 (range 1–7) for the pretest and 9.88 (range 6–12) after the program, with a p value (0.001) < α . The means of the behavior test scores were 2.79 (range 1–5) for the pretest and 4.52 (range 2–7) after the program, with a p value (0.001) < α . These results showed that the people’s knowledge and behavior levels were increased regarding open defecation after the intervention program.

TABLE 1: Comparison of resident knowledge and practice scores pre-and post-intervention related to knowledge and practice of open defecation free.

Indicator	Pretest	Posttest	p value
Knowledge (scale 0-12)	4.14 (min.1– max. 7)	9.88 (min. 6–max. 12)	0.001
Behavior (scale 0-7)	2.79 (min 1– max 5)	4.52 (min 2–max 7)	0.001

The knowledge measurement consisted of four categories: proper and healthy defecation standard, impact of open defecation, clean and healthy behaviors, healthy sanitation system. The behavior measurement consisted of two categories: the residents’ defecation habits and their practice on clean and healthy behaviors. Mean of each category can be seen in Table 2.

TABLE 2: Comparison of resident knowledge and practice scores pre-and post-intervention for each of the assessed indicators related to knowledge and practice of open defecation free.

Indicator	Pretest	Posttest	p value
Knowledge			
Proper and healthy defecation standard	1.33	1.98	0.001
Impact of open defecation	0.45	0.95	0.001
Clean and healthy behaviors	1.50	2.79	0.001
Healthy sanitation systems	0.86	4.17	0.001
Behavior			
Defecation habits	2.19	3.60	0.001
Clean and healthy behaviors	0.60	0.93	0.019

As shown in Table 3, there was no negatively ranked data for the knowledge variable. This means that all the data indicated that the knowledge levels of respondents after the intervention were higher (positive) when compared to their knowledge levels before the intervention program. The tables showed that the mean of the knowledge and behavior variables after the intervention were higher than those before the intervention program.

TABLE 3: Rank for each indicator.

Indicator		Negative rank ^a	Positive rank ^b	Ties ^c	Total
Knowledge	N	0	41	1	42
	Mean rank	0.00	21.00		
Proper and healthy defecation	N	1	18	23	42
	Mean rank	5	10.28		
Impact of open defecation	N	2	23	17	42
	Mean rank	13.00	13.00		
Clean and healthy lifestyle habits	N	2	36	4	42
	Mean rank	11.00	19.97		
Healthy sanitation systems	N	0	40	2	42
	Mean rank	0.00	20.50		
Behavior	N	2	33	7	42
	Mean rank	11.25	18.41		
Defecation habits	N	2	33	7	42
	Mean rank	13	18.30		
Clean and healthy lifestyle habits	N	5	14	23	42
	Mean rank	8.00	10.71		

^aPosttest result < pretest result
^bPosttest result > pretest result
^cPosttest result = pretest result

3.2. Qualitative data for exploring the knowledge, perceptions, opinions, and sociocultural factors of the related communities about their defecation behavior

Open defecation had become a habit of Sukajaya villagers, and many sociocultural factors encouraged this behavior. Based on the results of the focus group discussions conducted before the intervention program, the habits of open defecation and bathing in the river were common among the residents of the Cigaruguy subvillage due to the lack of available toilets and the high cost of the materials needed to build sanitation systems. Therefore, the residents felt more comfortable defecating in the river. The factors related to the open defecation habits in the river of the people of the Iringowo subvillage were no different from those of the Cigaruguy residents (i.e., the residents felt that it was more practical to defecate openly, without worrying about water, because there was more water in the river). The following statements are quotes from the residents who participated in the focus group discussion:

“I do not have a toilet. It is hard to get the material to make toilets, and the place to get the materials is far away. This makes them very expensive. We do not have the money to make our own toilets.” (Cigaruguy villager)

“There’s no water in the houses during the dry season, but the water always flows in the river, so we don’t have a bathroom in the house yet.” (Cigaruguy villager)

Demand-driven approach was expected to enhance the defecation practice knowledge and the related behaviors of the residents by building a construction of public toilets and motivating health education about sanitation practices, as well as establishing business groups that supported and supplied the village with sanitation resources. Based on the results of the focus group discussions conducted after the intervention, the people of the Cigaruguy and Iringowo subvillages were generally aware of the healthy latrine standards, the benefits of defecating in clean latrines, and the effects of open defecation. The following quotations are excerpts from the focus group discussions about the standards of good and healthy latrines:

“Should be closed, and should have a septic tank...” (Cigaruguy villager)

“The holes should be covered by a sawdust, the disposal should not be messy, and there should be a source of water to rinse.” (Iringowo villager)

The villagers from both sub-villages were also aware that proper defecation should be conducted in an enclosed place. The residents also knew the impact of open defecation. Here are some of the focus group statements:

“We could become ill if we defecate in an open area.” (Cigaruguy villager)

“We might get diarrhea, which is embarrassing.” (Iringowo villager)

After the construction of the latrines, based on authors observations, many villagers, both in Cigaruguy and Iringowo sub-villages, used public toilet for defecation. This was also indicated by the results of the in-depth interviews with the community leaders and the health center staffs:

“...Ordinary defecation in the river, now there is a place...” (Iringowo subvillage community leader)

“...Much different change, happy, it can be used together...” (Health center staff)

Based on the results of the focus group discussions, the community residents changed their habit of defecating in the river into in toilets. However, not all residents changed their habits immediately; some of them needed some time to adapt to the new practice:

“We started to change. Before, we defecated in the river, but now, in latrines. But we need to adapt ourselves.” (Iringowo villager)

“Now, we move to the toilets to defecate.” (Iringowo villager)

In this research, the residents of the village of Sukajaya, especially from the Cigaruguy and Iringowo sub-villages, also sought feedbacks related to demand-driven approach sanitation program. Based on the results of the focus group discussions, all the residents felt grateful and happy about the program. Here are some of the statements that they mentioned:

“Thank God, we are very grateful and happy because we already have good toilets.” (Cigaruguy villager)

“There are many benefits. If you want to pray or defecate, just go to the toilets in the mosque.” (Iringowo villager)

Based on the in-depth interviews, the community leaders from the Cigaruguy and Iringowo sub-villages and the health center staff also felt grateful, and they hoped that their success story would trigger same changes in other villages. Here are the excerpts from the in-depth interviews:

“...Thank God, nice...” (Cigaruguy subvillage community leader)

“...Thank you for your help. Hopefully, it can trigger another village...” (Health center staff)

4. Discussion

In this study, the knowledge levels of the respondents before the intervention were low, with a mean score of only 4.14 (range 1–7). This low score was due to the lack of education and the low socioeconomic status of the respondents. In addition, health information, access to health services, and the cultural habit of open defecation in the village also affected the respondents' knowledge levels. These results are supported by the research conducted by Akter and Ali, who stated that clean and healthy lifestyle behaviors are largely influenced by the knowledge level and awareness of issues related to health and the environment [8].

After the intervention program, the residents' mean knowledge score increased to 9.88 which indicated that the residents knew how to defecate in the toilets, understood the negative impacts of open defecation, adopted clean and healthy lifestyle habits, and learned what a healthy sanitation system was. These results correspond with those from the study by Junias, who reported that there was a correlation between knowledge and an open defecation habit [1].

The results of this study showed a change in the open defecation practice from 2.79 to 4.52 after participating in the intervention program. The changes in the residents' habits in this study corresponded with the research findings of Alzua, in which 83% of the residents stated that they stopped open defecation after participating in a community-based sanitation program that prompted them to acquire healthier lifestyles [9].

The results of this research showed changes and improvements in every indicator in both the knowledge and behavior variables. Moreover, the results presented in Table 2 showed that the people's understanding of healthy sanitation had changed significantly. This change was due to the intervention program that allowed the community to participate directly in constructing public toilets and creating village sanitation business groups. The clean defecation habits of the sub-village residents also improved significantly due to the availability of public toilets that could be used by the community. These helped the residents to learn how to defecate on toilets, and they prompted the residents to build toilets in their own houses.

5. Conclusion

Indonesia adopted CLTS as the Ministry of Health's Regulation No. 3 in 2014, which became the main strategy for solving sanitation problems in Indonesia. However, some regions found it difficult to implement the program because some of the poorer communities expected aid from the government or a nongovernmental organization. This is what has happened in the village of Sukajaya, particularly in the sub-villages of Iringowo and Cigaruguy.

Many factors still influence open defecation habits in Sukajaya village, including economic factors and the residents' poor awareness of health and sanitation. One can assume that economic limitations, the residents' mindsets, and an expectation for external aid will become obstacles when carrying out community-based sanitation programs. Therefore, a good method for conducting an interventional program that reduce the level of open defecation in Sukajaya village is still needed. This can be accomplished by applying demand-driven approach as a modification to the community-based sanitation programs, so that community members will gain the desire and ability to improve their knowledge of proper defecation practices and change their habits.

Demand creation can prompt individuals to desire proper sanitation facilities, pushing them to obtain toilets. Supply creation generates village sanitation business groups that produce cheap sanitation materials, which allow the community to obtain these materials at reasonable prices, as well as improve their economy. Further studies should be conducted to deepen the understanding of this phenomenon in a similar location.

Acknowledgments

The authors would like to acknowledge the funding and technical support from Ministry of Ministry of Technology, Research, and Higher Education through the Hibah Bina Desa 2016 (Village Development Grants) which made this research possible. The authors would like to express their deepest gratitude to the students affiliated with Association of Extension Program Students, the Faculty of Public Health, University of Indonesia.

Competing Interests

The authors declare that they have no conflicts of interest regarding this research.

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