



The Effectiveness of the 'Create' Trigger Model to Improve Open Defecation Free Behavior

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ABSTRACT

Although strongly associated with child mortality, many households still do not have safe sanitation facilities. Community-Based Total Sanitation (CLTS) promotes the construction of latrines to eradicate open defecation. However, several factors have been reported to hinder the process of effective behavior change and sustainability. This study analyzes the effectiveness of the CREATE model to improve ODF behavior compared to the classical. The trial was conducted in three villages from three districts. Sixty households were involved from each village (N=180), divided into the CREATE group and the classical model as a control. Data were analyzed with a Chi-square test followed by Crude OR. The results showed that most CREATE groups' education was a maximum of elementary school graduates (48.9%) and worked as own-account workers (56.7%). The classical group dominantly graduated from junior high school (52.2%), and 31.1% did not work. Overall (N=180), the application of the CREATE model showed a significant effect on changes in ODF behavior (p -value<0.01), with a probability 4.7 (2.5 - 8.9) times greater. Research has proven that the CREATE model can change ODF behavior better than the classical model. Investigation of the psychosocial determinants of CLTS in both models was suggested in a longitudinal design.

Kata kunci:

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ABSTRAK

Meskipun sangat terkait dengan kematian anak, banyak rumah tangga yang masih belum memiliki fasilitas sanitasi yang aman. Sanitasi Total Berbasis Masyarakat (CLTS) mempromosikan pembangunan jamban untuk memberantas buang air besar sembarangan (ODF). Namun, beberapa faktor telah dilaporkan menghambat proses perubahan perilaku yang efektif dan keberlanjutannya. Penelitian ini menganalisa efektivitas model CREATE untuk meningkatkan perilaku ODF dibandingkan dengan model klasik. Uji coba dilakukan di tiga desa dari tiga kecamatan. Enam puluh rumah tangga yang terlibat dari setiap desa (N=180), dibagi menjadi kelompok CREATE dan model klasik sebagai kontrol. Data dianalisis dengan uji Chi-square dilanjutkan dengan Crude OR. Hasil penelitian menunjukkan bahwa sebagian besar pendidikan kelompok CREATE maksimal lulusan SD (48,9%) dan bekerja sebagai wiraswasta (56,7%). Kelompok klasik dominan tamat SMP (52,2%), dan 31,1% ditemukan tidak bekerja. Secara keseluruhan (N=180), penerapan model CREATE menunjukkan pengaruh yang signifikan terhadap perubahan perilaku ODF (p -value<0,01), dengan probabilitas 4,7 (2,5 - 8,9) kali lebih besar. Penelitian telah membuktikan bahwa model CREATE dapat mengubah perilaku ODF lebih baik daripada model klasik. Investigasi determinan psikososial CLTS pada kedua model disarankan dalam desain longitudinal.



INTRODUCTION

Diarrhea is still a public health problem because of its high morbidity and mortality, especially in children under five. In 2017, diarrhea accounted for around 480,000 deaths of children under five (UNICEF, 2020). Another study states that about 2.5 billion cases of diarrhea in children under five are reported annually, and every day about 1,400 end in death (Sanyaolu, Okorie, Marinkovic, Jaferi, & Prakash, 2020). In Indonesia, diarrhea is the second largest cause of death in children under five, with an incidence rate of 11% (Kemenkes RI, 2019).

Diarrhea is a disease with changes in the consistency of soft stools and the frequency of defecating at least three times in 24 hours, accompanied by vomiting or bloody stools (Agtini, 2011; Ugboko, Nwinyi, Oranusi, & Oyewale, 2020; UNICEF, 2020). The most common causes in children under five are *V. cholera*, *C. botulinum*, *Shigella*, *C. jejuni*, *E. coli*, *Salmonella*, and *S. aureus* (Sanyaolu et al., 2020; Ugboko et al., 2020). Diarrhea is transmitted in several environmental pathways through the fluid-fingers-food-fields-flies mechanism (Pickering et al., 2018; Yushananta & Bakri, 2021).

Diarrhea is strongly associated with open defecation, lack of access to safe latrines, lack of awareness of hygienic practices, and use of contaminated water (Chambers, 2009). As a result of open defecation, 1.8 billion people worldwide use drinking water contaminated with fecal bacteria (WHO UNICEF, 2017). In addition, diarrhea is also related to knowledge, education, malnutrition, family income, and dirty water disposal (Adisasmito, 2007; Agtini, 2011; Purwanti, Arundina, & Yanti, 2015; Sanyaolu et al., 2020; Ugboko et al., 2020; UNICEF, 2020; Yushananta, 2018).

Prevention and control of diarrhea are mainly carried out with the intervention of sanitation facilities and clean water (Ahyanti, Rosita, & Yushananta, 2020; Hutton et al., 2014; Sanyaolu et al., 2020; Ugboko et al., 2020; UNICEF, 2020; Yushananta, 2018; Yushananta & Bakri, 2021). Interventions that are not difficult (Sanyaolu et al., 2020) and low-cost (Hutton, 2013; Hutton, Haller, & Bartram, 2007; Hutton et al., 2014; Yushananta & Bakri, 2021). Therefore, the global commitment in the SDGs agenda has set out to increase access to safe drinking water and sanitation sources for the entire population (Donoghue & Kamau, 2015). It is hoped to be realized in Indonesia in 2030 (BAPENAS, 2019).

The Ministry of Health has developed a community lead total sanitation program (CLTS) with the first objective is open defecation free (Kemenkes RI, 2014). This program does not provide financial assistance to construction of latrines but is oriented towards changing people's behavior. However, the construction of latrines is an indicator of behavior change (Kemenkes RI, 2014, 2016). An essential activity in implementing the STBM program is village triggering, which is an activity to encourage changes in people's behavior on their awareness by touching the feelings, mindset, behavior, and habits of individuals or communities (Kemenkes RI, 2014, 2016). Triggering is carried out in nine steps, namely: 1) introduction and delivery of objectives, 2) ice-breaking, 3) agreement on terms 4) mapping, 5) transect-walk, 6) simulation of contaminated water, 7) triggering change, 8) collective agreement, and 9) follow-up plans (Kemenkes RI, 2016).

Several obstacles were reported in implementing the national CLTS program, namely financial, institutional, technical, and community participation (Arfiah, Patmawati, & Afriani, 2019; Ekasulistiyawaty et al., 2020). Other reports reveal several weaknesses of the method: poor coordination

between stakeholders, lack of continued understanding after triggering, a weak follow-up to track progress, and lack of economic capacity for the construction of latrines. These would be obstacles to effective behavior change and sustainability (Chambers, 2009; Kasjono, 2021; Mlenga & Baraki, 2016; Tessema, 2017).

The CREATE (Creative Resources Essentials and Tools For Emergencies) model is the development of a classical model that prioritizes changes in sedentary behavior as the primary indicator, followed by the construction of latrines. Deferent with classical model, the primary indicator is the construction of latrines as a form of behavior change. As a result, poor households continue to practice open defecation until they build sanitation facilities. It will be threaten households that have changed behavior through contamination of water and food sources (Coffey, Geruso, & Spears, 2018; Julian, 2016; Root, 2001). Collective behavior changes are needed to achieve an environment free from open defecation.

In CREATE, two steps were added in triggering activities, namely the development of creative ideas and community assistance. The development of creative ideas gives the community the freedom to choose and determine where to defecate, such as construction of latrines, public toilets, or taking a ride. Furthermore, the facilitator will refine this choice in the form of a commitment statement witnessed by community leaders (Kasjono, 2021). In addition, to maintaining motivation, this step ensures that people do not open defecation after triggering. Motivation is the basis for the formation of behavior change. Motivation can change due to external factors such as economic, social, and weak supervision (Ahyanti et al., 2020; Yushananta, Ahyanti, & Hasan, 2018; Yushananta, et al., 2021).

Community assistance steps are carried out by community leaders together with health workers. Assistance is carried out continuously to monitor household defecation behavior, continuity of understanding after triggering, and technical assistance for sanitation facilities. Yushananta, et al. (2021) report that the assistance can maintain household commitments not to open defecation and accelerate the process of building of safe latrines. This study aims to analyze the effectiveness of the CREATE model compared to the classical model on changes in open defecation behavior.

METHOD

Study design and setting

The study was conducted in three districts (Mutilan, Muaro Jambi, and Surabaya) to to analyze the effectiveness of the CREATE model compared to the classical model on changes in ODF behavior. Outcomes are assessed from the behavior of constantly defecating in sanitation facilities and willingness to build healthy sanitation facilities independently. One village was chosen purposively for each district, namely a) Tamanagung Village, Muntilan Regency, Central Java Province; b) Penyengat Olak Village, Muaro Jambi Regency, Jambi Province; and c) Kertajaya Village, Surabaya City, East Java Province.

The study was conducted after obtaining approval from the Health Research Ethics Committee of the Yogyakarta Health Polytechnic. Permissions from the Health Office and puskesmas have also been obtained. Guided by the Helsinki protocol, consent has been taken, and data handling is confidential. There is no risk of harm to participants, and

participants have the right to withdraw during the study. All research procedures were explained before the interview.

Study period and participant

The study was conducted from April to August 2020. Households without safe latrines who lived for at least six months in the study area were included in the study. Households that did not have a yard and a source of clean water were excluded from the study.

Sixty households were randomly selected in each village with an equal ratio (1:1), in the CREATE and classical groups. The CREATE group is all households that receive the CREATE model triggering intervention. In comparison, classical got standard model triggering. The study involved six facilitators who had been trained in both intervention models to get the same quality.

Data collection and analysis

Data collection was done by interview and observation. All participants were asked about education, occupation, marital status, and homeownership status. After the intervention, house-to-house observations were made to assess changes in defecation behavior and the construction of latrines.

Data were collected after being checked for completeness, coded, and analyzed using the SPSS 24.0

statistical tool (CL=95%). An outcome code is given, 1 for changing behavior and 0 for not changing behavior. Bivariate analysis used Chi-square to measure the relationship between the driving model and the outcome (ODF). Calculations of Crude OR and CI = 95% were also carried out to assess the probability of behavior change.

RESULTS AND DISCUSSION

An assessment of 75 informed consent documents in the A total of 180 (90 CREATE and 90 classics) household head participated in this study. No one dropped out during the study period, so the participation rate was 100%. Most of the participants were male (Table 1). In the CREATE group, the majority (48.9%) of participants did not go to school until they finished elementary school. While in the classical group, the participants' education was dominated by junior high school graduates (52.2%).

About half of the study participants in the CREATE group (56.7%) were self-employed. The proportion of participants who unemployment was higher in the classic group (31.2%) compared to the CREATE group (22.2%). In both groups, the majority of participants are married and have their own house (Table 1).

Table 1.
Characteristics respondent

Characteristic	Muntilan		Jambi		Surabaya		Total (%)	
	CREATE	Classic	CREATE	Classic	CREATE	Classic	CREATE	Classic
1. Gender								
Male	22	20	26	26	26	27	74 (82.2)	73 (81.1)
Female	8	10	4	4	4	3	16 (17.8)	17 (18.9)
2. Educational attainment								
≤ Primary School	16	11	14	14	14	14	44 (48.9)	39 (43.3)
Junior High School	11	17	7	15	7	15	25 (27.8)	47 (52.2)
Senior High School	1	2	8	1	8	1	17 (18.9)	4 (4.4)
Collage	2	0	1	0	1	0	4 (4.4)	0 (0.0)
3. Employment Status								
Unemployment	0	0	12	16	8	12	20 (22.2)	28 (31.1)
Agricultural	1	2	3	14	0	0	4 (4.4)	16 (17.8)
Own account worker	23	26	11	0	17	17	51 (56.7)	43 (47.8)
Non-government employee	0	0	1	0	1	0	2 (2.2)	0 (0.0)
Government employee	2	0	0	0	1	1	3 (3.3)	1 (1.1)
Others	4	2	3	0	3	0	10 (11.1)	2 (2.2)
4. Marital Status								
Unmarried	1	1	2	0	2	0	5 (5.6)	1 (1.1)
Married	28	27	27	28	27	28	82 (91.1)	83 (92.2)
Divorce	1	2	1	2	1	2	3 (3.3)	6 (6.7)
5. House								
Own house	26	24	19	21	16	18	61 (67.8)	63 (70.0)
Rent/ Others	4	6	11	9	14	12	29 (32.2)	27 (30.0)

Table 2 shows the effect of treatment (CREATE model) on changes in defecation behavior, assessed up to the end of the third week. In Tamanagung Village (Muntilan Regency), the proportion of behavioral changes was significantly different between the CREATE and classical groups (p-value=0.003). The probability of behavior change with the CREATE model is 4.9 (1.6 - 15.1) times greater than the classical model.

Behavioral changes were also seen to be significantly different between the two groups in Jambi (p-value=0.035) and Surabaya (p-value=0.003). Meanwhile, the probability of

behavior change with the CREATE model is 3.1 (1.19 - 9.2) and 11.7 (2.9 - 47.4). Overall (N=180), the triggering of the CREAT model showed a significant effect on changes in open defecation behavior (p-value<0.01), compared to the classical model. The probability of behavior change is 4.7 (2.5 - 8.9).

Table 2.
Statistically analysis

Variables	OD n (%)	ODF n (%)	p-value	OR (95%CI)
Muntilan (n=60)				
Classical model	23 (76.7)	7 (23.3)	0.003	4.9 (1.6 - 15.1)
CREATE model	12 (40.0)	18 (60.0)		
Jambi (n=60)				
Classical model	16 (53.3)	14 (46.7)	0.035	3.1 (1.19 - 9.2)
CREATE model	8 (26.7)	22 (73.3)		
Surabaya (n=60)				
Classical model	27 (90.0)	3 (10.0)	0.003	11.7 (2.9 - 47.4)
CREATE model	13 (43.3)	17 (56.7)		
Total (N=180)				
Classical model	66 (73.3)	24 (26.7)	0.000	4.7 (2.5 - 8.9)
CREATE model	33 (36.7)	57 (63.3)		

OD=open defecation; ODF=open defecation free

The study results revealed that applying the CREATE model significantly ($p\text{-value} < 0.01$) could increase changes in open defecation behavior compared to the classical model. The proportions of the two models are 63.3% and 26.7%. The probability of behavior change with the CREATE model is 4.7 (2.5-8.9) times greater. These results prove that the CREATE model is effective as a triggering method in changing open defecation behavior.

Three criteria must be used to assess a quality method or program: validity, practicality, and effectiveness (Nieveen, 1999). Valid if there is a consistent relationship between the components of the method developed and the characteristics of the model applied; practical if easy to implement; and effective if the method can achieve the goal (Asyafah, 2019; Fatmawati, 2016). Effectiveness is also assessed from the achievement of targets (quantity, quality, and time), so the greater the percentage of targets achieved, the higher the effectiveness (Edam, Sofia Pangemanan, & Kairupan, 2018).

According to the Kemenkes RI (2016), triggering is an activity to encourage changes in individual or community behavior by touching individuals' feelings, mindset, behavior, and habits, which is carried out by holding meetings with the community. Although there is much evidence that the classical triggering model can induce changes in defecation behavior, several weaknesses have also been pointed out, namely poor coordination between stakeholders, lack of continued understanding after triggering, a weak follow-up to track progress, and the low of economic capacity for construct of latrines. These weaknesses are obstacles to an effective behavior change and sustainability process (Chambers, 2009; Kasjono, 2021; Mlenga & Baraki, 2016; Tessema, 2017). The CREATE method was developed to minimize the weaknesses of the classical model by adding two steps: developing creative ideas and community assistance.

In this study, the development of creative ideas has led to choices of places to defecate, including construction of latrines, public toilets, riding to neighbors, and public facilities such as mosques, gas stations, and minimarkets. Then, the facilitator will confirm the choice of each individual, witnessed by community leaders. People's choices are strongly influenced by economic capacity. In the good economic group, defecate place is to construct of latrines. However, the poor need time to prepare for the construct of latrines. However, the critical thing in this process is the change in people's behavior in defecating, both during construction and when they are ready to construct of latrines.

In contrast to the classical model, the construction of latrines indicates changes in defecation behavior. This concept does not consider the community's economic capacity because development must be carried out independently. People are not given wise choices to defecate healthy places if they cannot construct latrines. In Table 1, it can be seen that 31.1% of participants in the classical group unemployment. Probably it is the cause of the low achievement of behavior change. According to some previous studies (Coffey et al., 2018; Julian, 2016; Root, 2001).

Continuous community assistance by village leaders and health workers is the key to successful behavior change. In addition to providing technical assistance for the construction of latrines, this stage also monitors household commitments not to open defecation and to continue understanding after triggering. Mlenga & Baraki (2016) stated that changes of behavior and latrines construction involve emotional sensitivity and the influence of traditional leadership and the role of traditional influence is very important. Having a latrines does not necessarily result in its use; it must be monitored and understood continuously. Assistance can maintain household commitments not to open defecation and accelerate the construction of latrines (Yushananta et al., 2021).

Table 1 shows that the educational level of the classical group is better than CREATE, but the level of achievement of behavior change is lowest. These results indicate that the level does not affect changes in defecation behavior and the construction of sanitation facilities. Following Mlenga & Baraki (2016), the construction of latrines is not influenced by the level of education but by continuous assistance by community leaders. Gebremariam, Hagos, & Abay (2018) dan Tessema (2017) also found the same results.

The trial of the CREATE model in three locations showed positive results on changes in defecation behavior also the entire population. These results indicate that this triggering model can be carried out on different regional and population characteristics. Tamanagung Village (Muntilan Regency, Central Java) is a rural area in the mountains; Penyengat Olak Village (Muaro Jambi Regency, Jambi) is located on a riverside near an urban area; and Kertajaya Village is in a densely populated city. Although it has given positive results, investigating psychosocial determinants in longitudinal designs needs to understand the behavior change.

CONCLUSIONS AND SUGGESTIONS

Empirically the study has proven that the CREATE triggering model provides better results for changes in open defecation behavior and latrines construction than the classical model. Trials in three research locations showed effective results, although the characteristics of the population and area varied. The development of creative ideas gives the community a choice of temporary defecation places while building independent latrines. Continuous assistance by community leaders is an essential key to successful behavior change. However, it is crucial to investigate psychosocial determinants in longitudinal designs to study behavior change.

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ETHICAL CONSIDERATIONS

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Conflict of Interest Statement

The authors declared that they have no conflict of interests.

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