

The Influence of Defecation Behavior, Drinking Water Sources, and Handwashing Habits N Stunting in the Work Area of Merek Community Health Center

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ABSTRACT

This research was conducted due to the low motivation of the community in the work area of the Brand Health Center to build *CTPS* facilities, healthy latrines, and clean water management systems. The limited ownership of these facilities is a major factor contributing to the failure to achieve key indicators of *STBM*, such as the high prevalence of open defecation. This study employed an action research design with an observational approach and educational interventions. The process began with problem identification through observation and surveys, followed by community education and assistance in constructing *CTPS* facilities, managing clean water, and building latrines. Before the intervention, residents in several villages within the Brand Health Center area were less motivated to develop *CTPS* facilities, clean water systems, and latrines, due to low knowledge, financial constraints, and limited awareness of the importance of a clean and healthy lifestyle. After direct education and mentoring, there was an increase in motivation and independent efforts by the community to establish these facilities. The results showed improvements such as a reduction in open defecation, the adoption of handwashing with soap, and better practices in managing drinking water. To ensure sustainability, it is recommended that regular supervision and continued assistance be provided so that these achievements remain consistent in the long term.

Keywords : Improvement, RT, Stop BABS, *CTPS*, Water Management

INTRODUCTION

This study focuses on the low community motivation to build handwashing facilities with soap (*CTPS*), healthy latrines, and clean water management systems in the work area of the Brand Health Center. This condition results in low ownership of these facilities, thereby contributing to the failure to achieve the main indicators of the Community-Based Total Sanitation (*STBM*) program, such as high open defecation behavior, the lack of habit of washing hands with soap, and suboptimal drinking water management (Ministry of Health of the Republic of Indonesia, 2015).

Community motivation and the role of health workers are critical in supporting behavior change and the development of sanitation facilities at the household level (Karim, Pradipta, & Setiawan, 2019). Efforts to improve public health require integrated interventions addressing various environmental risk factors (Olorunsogo et al., 2024). Research related to the design and construction of drinking water treatment facilities has been conducted because contaminated drinking water is a major source of environment-based disease transmission, such as diarrhea and cholera. Therefore, the community needs to be accompanied in developing safe, independent water treatment systems (Ministry of Health of the Republic of Indonesia, 2015).

Research on the construction of qualified fecal disposal sites is based on the high practice of open defecation, which leads to environmental pollution and disease transmission. The availability of healthy toilets is strongly associated with the reduction in the incidence of environment-based diseases (Clasen, Schmidt, Rabie, & Roberts, 2007). The formation of

community groups (*Kelompok Swadaya Masyarakat / KSM*) that independently build toilets or latrines is a key research focus, as group participation and ownership play a significant role in the sustainability of sanitation programs. Community-based approaches have been proven effective in accelerating behavior change and achieving sanitation indicators (Tistiawati, Darmiati, & Amelia, 2021).

The construction of handwashing facilities with soap is also essential, as this practice has been scientifically proven to reduce the risk of infectious disease transmission, particularly through contaminated hands. However, the lack of infrastructure and motivation represents a major challenge that needs to be addressed through research (Curtis & Cairncross, 2003).

Previous studies provide strong evidence but also highlight notable gaps. Research has shown that interventions increasing knowledge, awareness, and technical support from health workers can encourage active community participation in building hygiene facilities and managing the environment, which in turn positively impacts family and community health (Harries, Kayembe, Kaluwa, Chalamilla, & Dzekedzeke, 2018). Freeman et al. (2014) demonstrated that global handwashing with soap (*HWWS*) practices after fecal contact remain low despite significant health benefits; however, their review primarily focused on prevalence and risk estimates without analyzing household motivational determinants, the role of health worker facilitation, or the integration of multiple *STBM* pillars (*HWWS*, healthy latrines, and safe drinking water). Meanwhile, Venkataramanan et al. (2018), through a mixed-methods systematic review of *Community-Led Total Sanitation (CLTS)*, reported inconsistent impacts due to heterogeneous designs and reporting quality; yet, the study did not comprehensively examine implementation factors such as the intensity of health center facilitation, material or financial support, and long-term household ownership of sanitation facilities.

The objectives of this study are threefold: (1) to identify determinants of motivation and barriers (knowledge, social norms, costs, and access to materials/techniques), (2) to evaluate the contribution of technical and behavioral support from health workers to household ownership and practices, and (3) to formulate integrated and context-specific *STBM* strategies, including behavior change communication, low-cost facility design, and community support schemes. The benefits of this study include a theoretical contribution in the form of an integrative framework linking motivation and facilitation within *STBM*, as well as practical recommendations for health centers, local governments, and community groups to accelerate sanitation targets (*ODF*, *HWWS*, safe water) and strengthen household-level sanitation resilience.

RESEARCH METHODS

This study employed an action research design with an observational approach and educational interventions. Action research was chosen because it allows researchers to play an active role in the process of social and community change through direct intervention (Kemmis & McTaggart, 2005).

The research process began with problem identification through field observations and surveys to understand the initial conditions of the community related to handwashing with soap (*CTPS*) facilities, clean water management, and latrines (Stringer, 2014). Following this stage, education and assistance were provided to the community as an intervention aimed at increasing residents' awareness and motivation to build and maintain these facilities.

During the intervention process, the researcher observed and evaluated changes in community behavior in a real and sustainable manner, ensuring that the outcomes of this study

are not only theoretical but also provide practical solutions that can be directly implemented (Omek, 2006).

RESULTS AND DISCUSSION

The implementation of proper clean drinking water management is essential in reducing the risk of diseases related to the environment. Proper water management includes the hygienic provision, storage, and distribution of water and appropriate treatment to ensure that the water consumed is safe from biological and chemical contamination. The community-based management approach is often used to ensure the sustainability and maintenance of drinking water systems. Community involvement from the planning stage to facility maintenance allows for effective management at an affordable cost and technology that suits local conditions. Thus, the risk of diseases such as diarrhea, cholera, and parasitic infections can be significantly reduced (Chusniati S, 2018)

Reducing open defecation behavior (BABS) and increasing the habit of washing hands with soap are important indicators of the success of the Community-Based Total Sanitation (STBM) program. The declining behavior of defecation shows that more and more people are actively using healthy latrines, so that the risk of pollution of clean water sources is reduced. Meanwhile, increasing the habit of washing hands with soap is very effective in preventing the spread of infectious diseases, especially diarrhea and other infectious diseases. Efforts to educate and empower the community through a participatory approach are the main keys to this behavior change. Community participation in maintaining cleanliness and the correct use of sanitation facilities directly has a positive impact on environmental and family health (Fitrianingsih, Sri Wahyuningsih, 2020).

The results of the research implementation in the work area of Brand District, Karo Regency, which includes the stages of environmentally friendly clean water management design, community education, the manufacture of healthy latrines, and the formation of non-governmental groups, can be summarized as follows:

Environmentally Friendly Clean Water Management Design

Water management systems are designed using simple technologies such as silica sand filters, activated carbon, and gravel, zeolite and palm oil

A water management system with simple technology that utilizes silica sand, gravel, activated carbon, and zeolite filter media interspersed with a layer of palm oil is an effective and environmentally friendly approach to improve water quality. The sand filter serves as the main filter that removes suspended solid particles, sediments, and microorganisms, including pathogens. In this filtration process, the sand layer not only physically filters, but also supports the formation of a layer of microorganisms (schmutzdecke) on the sand surface that plays a role in the degradation of organic matter and the biological elimination of pathogens. The gravel layer is used as a support for the filter structure and helps in the filtration of coarse particles as well as maintaining the stability of the sand medium. (Hamidah S, 2015).

Zeolite has additional filtering capabilities with ion-exchange and adsorption capabilities of heavy metals and chemical contaminants. (Selfia M, 2022). Overall, this simple technology enables reliable water treatment at low cost and minimal energy impact, supporting the goal of efficient and sustainable clean water management.

This design takes into account the socio-economic conditions of the people of Karo Regency so that it can be maintained independently and sustainably

The design of the water management system in Karo Regency was prepared by considering the socio-economic conditions of the local community, the majority of whom are horticultural farmers and have limited resources and infrastructure. This system is designed to be easy to operate and maintain independently by the community without the need for complex technology or high operational costs. This water management approach also emphasizes the aspect of active community participation in sustainable maintenance and management, because local communities have a central role as the main user and maintainer of these water resources (Nazifah, Sari DR, Putri NA, 2021).

With a simple, energy-efficient design, and in accordance with the community's capabilities, this system is able to increase water management independence, reduce dependence on external support, and maintain the sustainability of water availability. This strategy is in line with the collaborative management model that involves the community in planning, implementing, and evaluating the use of water resources to maintain optimal quality and quantity. The socio-economic conditions that are considered include the level of education, financial ability, and the pattern of joint management through non-governmental groups in Karo Regency (Sholahuddin, Fajarwati N, Jamin S, Damayanty N, 2025).

This approach can optimize the effectiveness of water supply systems and support adaptation to environmental challenges such as climate change and pollution threats, thereby ensuring sustainability and community welfare.

The use of palm oil as a natural medium interspersed in the filter layer has a mechanical function to filter fine particles and help reduce contaminants through physical processes. Palm oil is also easy to obtain and environmentally friendly, thus adding economic value and system sustainability. The arrangement of this filter media is usually arranged in layers so that each media performs its specific function in the water filtration and filtration process optimally.

This system is energy-efficient because it uses the principle of gravity without the need for electricity for pumping, and is easy to maintain, making it suitable for rural areas or areas with limited technology and financial resources.

Education on How to Make Clean Water Management Facilities

The community received face-to-face counseling with a demonstration of making simple filters from local materials such as sand, charcoal, and clean cloth

The community was given direct counseling (face-to-face) which was complemented by practical demonstrations of making simple water filters using local materials such as sand, charcoal, and clean cloths. This approach aims to improve people's understanding and skills in managing clean water independently, so that it can prevent diseases caused by polluted water. The live demonstrations also encourage active participation and make it easier for communities to apply effective water filtration methods in their environment (Harvey P, Pillinger J, Rees G, Butler M, 2017).

Educational materials emphasize the importance of clean water quality for family and environmental health as well as regular maintenance of water facilities

The educational materials provided to the community focus on the importance of

maintaining clean water quality for the health of families and the surrounding environment. In addition, emphasis is also given on the need for routine maintenance of water facilities so that the function and cleanliness of water sources are maintained. This education aims to increase public awareness and involvement in maintaining water cleanliness and extend the life of facilities to prevent the risk of diseases transmitted through polluted water (Clasen T, Schmidt W-P, Rabie T, Roberts I, Cairncross S, 2007).

Visual media and guidebooks are used to make it easy for all groups to understand

The use of visual media and guidebooks in the health education process plays a very important role in ensuring that messages or information can be accepted and understood by various groups of people, regardless of educational background, age, or literacy ability. Visual media, such as images, videos, and posters, are able to present information in an interesting and easily digestible manner, especially for people who have limited reading or understanding complex texts. Visualization also helps to facilitate the understanding of abstract or technical concepts related to healthy behavior and facility use (Glanz K, Rimer BK, Viswanath K, 2008).

This approach can also accommodate different learning styles in society, including visual, auditory, and kinesthetic learners, so that it is more inclusive and has a positive impact on the outcomes of public health interventions (Noar SM, Harrington NG, 2012).

Manufacture of Qualified Latrines

Toilets are built according to health standards with the characteristics of not polluting drinking water sources, smelling non-pungent, tightly closed, and safe for users

Latrines built according to health standards must have several important characteristics so that they do not pollute drinking water sources, do not smell strong, are tightly closed, and are safe for users (Ministry of Health of the Republic of Indonesia, 2007). This aims to prevent the transmission of various diseases caused by contamination of human feces and waste, such as diarrhea, cholera, and gastrointestinal infections (Health of the Republic of Indonesia, 2020). Fecal discharge that does not meet sanitary requirements can lead to soil and water pollution and become a breeding ground for disease vectors such as flies and cockroaches. Therefore, healthy latrines that meet standards must be built with watertight construction, have safe fecal management systems, such as watertight septic tanks and controlled waste infiltration, and tight latrine lids so that odors and direct contact of users with waste can be prevented. Latrines must also be easily accessible to users and maintained regularly so that their health functions are maintained. These latrine health standards are an important part of the Community-Based Total Sanitation Program (STBM) implemented in Indonesia to improve environmental health and prevent sanitation-related diseases (Sembiring P, Sastrawan G, Herawati T, 2020).

The latrine facilities are easy to clean and have ventilation and roof protection according to local conditions

A good latrine facility must be designed to be easy to clean, have adequate ventilation, and be equipped with a roof that provides protection according to local conditions. Ease of cleaning is essential to maintain cleanliness and prevent the buildup of dirt or mold that can be a source of disease. Adequate ventilation reduces unpleasant odors and moisture in the latrines, thereby creating a comfortable environment for users and inhibiting the development of bacteria or disease vectors such as flies and mosquitoes. Appropriate roof protection, for example taking into

account rainfall, sunlight intensity, and local wind conditions, ensures that the latrines remain sturdy and durable, and prevents rainwater from entering the latrine holes that can cause groundwater source pollution. Adaptation of the design to local conditions also pays attention to cultural factors and community habits so that facilities can be accepted and used sustainably (World Health Organization 2015).

The management of latrines by meeting these criteria is part of the healthy latrine standards recommended in the Community-Based Total Sanitation (STBM) program and is a crucial step in the prevention of diseases related to environmental sanitation.

Establishment of Non-Governmental Groups (KSM)

Non-Governmental Groups (NGOs) were formed as a community forum tasked with managing the construction and maintenance of Soap Handwashing facilities (CTPS), the provision of clean water, and the construction of latrines in their respective household environments. KSM plays an important role in supporting the sustainability of sanitation programs and healthy clean living behaviors at the community level by coordinating, supervising, and assisting residents. However, in some cases, KSM has not carried out this function optimally. This can be caused by a lack of capacity, understanding, motivation, resources, or support from related parties, resulting in the low effectiveness of the management of sanitation and clean water facilities in the field. Increasing the role of KSM is crucial to ensure that clean and healthy facilities and behaviors can continue to be maintained and developed sustainably (Susanto M, Harini A, 2019).

After the implementation of education and the formation of Non-Governmental Groups (KSM), there was a significant increase in the motivation and independent efforts of the community in building and managing Soap Hand Washing facilities (CTPS), the provision of clean water, and latrines. The education provided is able to increase public awareness of the importance of clean and healthy living behaviors, while the establishment of KSM facilitates the active participation of the community collectively in the construction and maintenance of these facilities (Tistiawati R, Darmiati D, Amelia D, 2021). This active community participation is very important so that community-based sanitation programs can run sustainably and have a real impact on the reduction of sanitation-related diseases. However, this success is highly dependent on the community's awareness and commitment to maintain the facilities that have been built as well as government support in assistance and supervision (Ani S, Jumiati, 2020).

Conclusion

This study concludes that an educative and participatory community approach is effective in increasing motivation and active participation in the construction of handwashing with soap (CTPS) facilities, clean water management systems, and healthy latrines. These behavioral changes directly contribute to achieving the main indicators of the Community-Based Total Sanitation (STBM) program in the work area of the Brand Health Center, Brand District, Karo Regency. The findings confirm that community motivation, combined with health worker facilitation, plays a central role in sustaining sanitation improvements. However, ensuring long-term consistency requires continuous community engagement, monitoring, and support from both local institutions and policymakers. For future research, it is recommended to conduct comparative studies across different regions to identify contextual factors influencing community motivation and STBM outcomes, employ longitudinal designs to capture sustainability over time,

and integrate quantitative impact evaluations with qualitative insights.

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First Publication Right:

Journal of Health Sciences

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