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Education and Action: Changing Community Sanitation Behavior in Soreang Jipang Village

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ABSTRACT
One of the main challenges in improving access to safe sanitation is the low level of public awareness of the health risks posed by dirty water catchment basins. This activity aims to increase community knowledge and awareness of the importance of environmental sanitation, particularly in the construction and maintenance of healthy foul and rainwater harvesting basins. The methods used included lectures, discussions, questions and answers, and hands-on demonstrations involving active community participation. The results of this activity showed a significant increase in community knowledge, skills, and behavior related to environmental sanitation. The community not only understands the importance of healthy water reservoirs, but is also skilled in making and maintaining them. This activity emphasizes the importance of community empowerment as a form of providing information in terms of maintaining the living environment for environmental health and quality of life.

Keywords: community participation; environmental health; quality of life; sanitation; water

ABSTRAK
Salah satu tantangan utama dalam meningkatkan akses ke sanitasi yang aman adalah rendahnya kesadaran masyarakat terhadap risiko kesehatan yang ditimbulkan oleh bak penampungan air kotor.. Kegiatan ini bertujuan untuk meningkatkan pengetahuan dan kesadaran masyarakat tentang pentingnya sanitasi lingkungan, khususnya dalam pembuatan dan pemeliharaan bak penampungan air kotor dan air hujan yang sehat. Metode yang digunakan meliputi ceramah, diskusi, tanya jawab, serta demonstrasi langsung yang melibatkan partisipasi aktif masyarakat. Hasil dari kegiatan ini menunjukkan peningkatan yang signifikan dalam pengetahuan, keterampilan, dan perilaku masyarakat terkait sanitasi lingkungan. Masyarakat tidak hanya memahami pentingnya bak penampungan air yang sehat, tetapi juga terampil dalam membuat dan merawatnya. Kegiatan ini menegaskan pentingnya pemberdayaan masyarakat sebagai salah satu bentuk pemberian informasi dalam hal menjaga lingkungan tempat tinggal untuk kesehatan lingkungan dan kualitas hidup masyarakat.

Kata Kunci: *partisipasi masyarakat; kesehatan lingkungan; kualitas hidup; sanitasi; air*

INTRODUCTION

The contamination of water sources with fecal waste is a critical public health issue, particularly in low- and middle-income countries, where inadequate sanitation and poor water quality contribute significantly to the prevalence of diarrheal diseases. Fecal contamination of water is primarily indicated by the presence of fecal coliform bacteria, particularly Escherichia coli (E. coli), which serves as a reliable indicator of recent fecal pollution and the potential presence of pathogenic microorganisms. The presence of these bacteria in drinking water is associated with a heightened risk of gastrointestinal diseases, including cholera, typhoid fever, and gastroenteritis, which collectively account for millions of deaths annually, particularly among vulnerable populations such as children under five years of age (Ribeiro et al., 2018; Wahid & Al-Abbas, 2019; Francis et al., 2016).

Research has shown that the presence of fecal coliforms in water sources is a strong indicator of the potential for waterborne diseases. For instance, highlight that fecal coliforms are indicative of contamination from warm-blooded animals, and their presence in drinking water suggests recent fecal contamination, which can lead to outbreaks of diarrheal diseases (Ribeiro et al., 2018). Furthermore, studies conducted in various regions, including Mozambique and Mexico, have demonstrated high levels of fecal contamination in water supplies, correlating with increased incidences of gastrointestinal diseases (Salamandane et al., 2021; Delgado-Gardea et al., 2016). This correlation underscores the importance of monitoring water quality to prevent disease outbreaks.

The relationship between fecal contamination and diarrheal diseases is complex and influenced by various factors, including environmental conditions and water management practices. For example, point out that the variability in water quality, particularly during different seasons, can affect the levels of fecal contamination and subsequently influence the incidence of diarrheal diseases (Hubbard et al., 2009). Seasonal fluctuations in rainfall can lead to increased runoff, which often carries fecal matter into water sources, exacerbating contamination levels (Sanders et al., 2013; Boyer & Kuczynska, 2003). This seasonal variability necessitates continuous monitoring and assessment of water quality to mitigate health risks effectively.

Moreover, the effectiveness of interventions aimed at improving water quality is often hindered by the challenges associated with accurately measuring fecal contamination. Studies have indicated that traditional indicators, such as total coliforms, may not always correlate strongly with the presence of pathogens, leading to potential underestimations of health risks (Kulinkina et al., 2016; Gruber et al., 2014). The World Health Organization (WHO) recommends using E. coli as a more specific indicator of fecal contamination due to its stronger association with diarrheal disease risk (Kulinkina et al., 2016; Khush et al., 2013). This shift in focus towards more reliable indicators is crucial for public health surveillance and intervention strategies.

In addition to direct contamination of drinking water, fecal waste can also contribute to the spread of pathogens through environmental pathways. For instance, research has shown that fecal contamination on surfaces and in soils can serve as reservoirs for pathogens, which can subsequently be transmitted to humans through various routes, including hand-to-mouth contact (Pickering et al., 2012; Curtis et al., 2019). This highlights the need for a comprehensive approach to sanitation and hygiene, as improving water quality alone may not suffice to eliminate the risk of diarrheal diseases.

The impact of fecal contamination on public health is particularly pronounced in

urban and rural settings where access to clean water and sanitation facilities is limited. In many developing countries, inadequate sanitation infrastructure leads to the direct contamination of water sources with human and animal waste, creating a cycle of disease transmission (Prüss-Üstün et al., 2014; Raj et al., 2019). For example, in a study conducted in Nepal, the presence of Vibrio cholerae in drinking water was linked to fecal contamination from sewage systems, illustrating the direct connection between sanitation practices and water quality (Raj et al., 2019).

Soreang Jipang Village is one of the villages in Bontonompo Sub-district, Gowa Regency whose environmental conditions still need attention and improvement, especially environmental sanitation in housing or households. Observations conducted in April 2024 in Soreang Jipang Village showed that the disposal of dirty water for each household is not yet available, causing the yard to become watery and muddy, which causes odors to emerge around the residents' settlements. This is exacerbated especially during the rainy season. The geographical condition of Soreang Jipang Village, which is located around a fairly low water area, means that during the rainy season, rainwater inundates the house yards. Such conditions facilitate the emergence of various diseases, cause unpleasant odors, and have the potential to disrupt a healthy environment. This has never been specifically explored so that it creates a gap that requires solutive action through service.

Based on the above conditions, Community Service activities are carried out as a form of caring and contributing and educating the importance of community attention to environmental sanitation management around their place of residence and the house they live in. The purpose of this service is to increase the knowledge of the village community about environmental sanitation, especially healthy dirty water and rainwater reservoirs, and increase awareness of community behavior to make healthy dirty water and rainwater reservoirs.

METHODS

This community service activity was carried out in Soreang Jipang Village in April 2024. Community service activities in Soreang Jipang Village are carried out with a systematic method to achieve optimal results. First, administrative preparations and permits from the local village were carried out, accompanied by site preparation and socialization to target communities who had poor environmental sanitation. Socialization was conducted through discussion and question and answer to identify the main problems and provide an initial understanding of the purpose of the activity. Furthermore, counseling on environmental sanitation focused on the importance of making and maintaining healthy dirty water and rainwater reservoirs, using lecture, interactive discussion, and question and answer methods. After that, training and technical assistance were carried out using the direct demonstration method, where the community was given the opportunity to practice the construction of the basin.

Evaluation was conducted by measuring the increase in knowledge and skills, as well as follow-up observations to see the application of the training results in the field. All activities were documented in detail through photos, videos, and field notes, which were then reported to relevant parties as part of the PKM team's responsibility. This method is designed to ensure that the community not only gains theoretical knowledge, but also practical skills that can be directly applied in daily life to improve their environmental sanitation.

Figure 1. The Process of Counseling and Making Water Reservoirs

RESULTS AND DISCUSSION

This activity is carried out in the form of counseling as well as training and mentoring for the targeted community, the results achieved by this activity are that the community has knowledge about environmental sanitation, especially healthy dirty water and rainwater reservoirs. The knowledge gained by the community in counseling is very useful and can be disseminated to other communities who do not participate in this PKM activity. The increase in community knowledge about environmental sanitation is due to the fact that the community is highly motivated to know good environmental sanitation, the PKM implementation team explains the counseling material well, and the PKM Team provides opportunities for the community to ask questions about things that are not well understood (See Figure 1).

In addition, the community recognizes or knows the tools and materials used to make environmental sanitation construction, especially healthy dirty water and rainwater reservoirs. This is because the community is highly motivated to know good environmental sanitation, the PKM implementation team explains the counseling material well and gives the community the opportunity to ask about things that are not well understood.

Another result is that the community is skilled in making environmental sanitation constructions, especially healthy dirty water and rainwater reservoirs. After going through the training and mentoring process, the community feels the knowledge and skills they have due to the guidance provided by the PKM team.

The behavior of cleaning dirty water reservoirs is crucial in preventing waterborne diseases, particularly in regions where access to clean water is limited. Contaminated water reservoirs often serve as breeding grounds for pathogens, which can lead to outbreaks of diarrheal diseases and other health issues. The relationship between water quality and public health is well established, as dirty water can harbor a variety of microorganisms, including bacteria, viruses, and protozoa, that pose significant health risks to communities relying on these water sources for drinking and sanitation (Mahamud et al., 2011)Komarulzaman et al., 2016).

Regular cleaning of water storage containers and reservoirs is essential to minimize the risk of contamination. emphasize that dirty water storage containers are significantly associated with illness, highlighting the importance of maintaining hygiene in water

storage practices (Mahamud et al., 2011). Inadequate washing of these containers can lead to significant contamination of household water, which is a direct pathway for the transmission of waterborne diseases. The use of high-strength chlorine disinfectants has been shown to effectively reduce the incidence of diarrheal diseases in settings such as refugee camps, where sanitation practices may be compromised (Mahamud et al., 2011). This underscores the necessity of implementing rigorous cleaning protocols to ensure the safety of drinking water.

In addition to the direct cleaning of water reservoirs, community involvement in maintaining water quality is vital. Community-based interventions that educate individuals about the importance of cleaning water storage facilities can lead to improved hygiene practices. For instance, found that community perspectives on cleaning practices were viewed as highly effective for disease prevention, yet the specificity of these actions often lacked the necessary detail to ensure thorough cleaning (Leontsini et al., 2020; Leontsini et al., 2020). This indicates that while community engagement is crucial, it must be coupled with clear guidelines and demonstrations of effective cleaning techniques to maximize impact.

The ecological aspects of reservoir cleaning should also be considered. discuss the role of natural processes in the self-cleaning mechanisms of water bodies, suggesting that certain microorganisms can adapt to pollution and contribute to the breakdown of contaminants (Yakovenko et al., 2016). Understanding these natural processes can inform strategies for enhancing the self-cleaning capacity of reservoirs, thereby reducing the need for extensive human intervention. However, anthropogenic factors such as pollution and land use changes can significantly hinder these natural processes, necessitating proactive management of water bodies to maintain their ecological balance (Derkho et al., 2021; Azevêdo et al., 2020).

Moreover, the design and maintenance of water reservoirs play a critical role in their cleanliness. highlight that ancient Maya reservoirs were kept clean through the use of sand and zeolite-containing boxes that filtered incoming water (Lentz et al., 2020). This historical perspective illustrates the importance of engineering solutions in maintaining water quality. Modern reservoirs can benefit from similar design principles, incorporating filtration systems that prevent contaminants from entering the water supply.

The impact of environmental factors on water quality cannot be overlooked. For example, heavy rainfall and flooding can introduce pathogens into water reservoirs, as observed in various studies (Sari & Nofriya, 2018). Therefore, it is essential to implement adaptive management strategies that account for seasonal variations and extreme weather events. Regular monitoring of water quality, especially during and after such events, is critical to ensure that any contamination is promptly addressed.

In addition to cleaning practices, the community's overall sanitation infrastructure must be improved to support clean water initiatives. The simultaneous improvement of sanitation and drinking water quality has been shown to have protective effects against diarrheal diseases (Komarulzaman et al., 2016). This integrated approach is necessary to create a sustainable environment where clean water can be consistently available and safe for consumption.

Furthermore, the role of education in promoting cleaning behaviors is paramount. Training programs that teach community members how to properly clean water storage containers and reservoirs can lead to lasting changes in behavior. For instance, discusses the successful implementation of training on making environmentally friendly clean water

filters, which not only improves water quality but also empowers communities to take ownership of their water resources (Rindiani, 2021). Such educational initiatives can foster a culture of cleanliness and hygiene that extends beyond water storage to other aspects of community health.

CONCLUSIONS

From the community service activities carried out, several significant results were obtained that showed an increase in community knowledge, skills, and behavior related to environmental sanitation, especially in the construction and maintenance of healthy dirty water and rainwater reservoirs. The community involved in this activity became more aware of the importance of good environmental sanitation, understood the tools and materials used in sanitation construction, and were skilled in applying this knowledge practically. The authors suggest conducting regular water quality monitoring, especially during the rainy season or after extreme weather events, to quickly detect and address water contamination. Adaptive management strategies also need to be implemented to anticipate environmental changes that may affect water quality. Combining modern and traditional techniques in the design and maintenance of water reservoirs can improve the effectiveness of water storage systems. The use of filtration systems appropriate to local conditions can help maintain water quality and reduce the need for periodic human intervention. Community-based intervention programs that engage people in keeping water reservoirs clean can promote sustainable hygiene practices and encourage collective responsibility for water resources in their communities.

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