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Assessing the Link between Community Engagement and Environmental Health Program Outcomes in Rural Indonesia

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Abstract. *Environmental health issues remain a major public health concern in rural Indonesia, where inadequate sanitation and waste management contribute to the persistence of preventable diseases. Community engagement in environmental health education is widely recognized as a key factor in enhancing program outcomes. This study aimed to assess the link between community engagement in environmental health education and the effectiveness of environmental health programs in rural Indonesia. A quantitative cross-sectional design was employed involving 467 respondents aged 17–74 years, with educational backgrounds ranging from no formal education to postgraduate levels. Data were collected using structured questionnaires and analyzed through Chi-Square and correlation tests. The findings revealed a statistically significant association between participation in environmental health education and program effectiveness ($p = 0.000$). The correlation coefficient ($r = 0.445$) indicated a positive and moderately strong relationship, suggesting that higher levels of engagement were associated with improved environmental cleanliness and health behaviors. These results underscore that participatory education fosters knowledge acquisition, behavioral change, and collective responsibility among community members. Strengthening participatory approaches through collaboration between local health authorities, educators, and residents is recommended to achieve sustainable improvements in environmental health and community well-being.*

Keywords: *Environmental health education, community engagement, public health, program effectiveness, rural Indonesia*

1. Introduction

Environmental-based diseases remain a significant public health concern, particularly in rural areas where living conditions are directly associated with the incidence of specific illnesses. Poor environmental sanitation increases the risk of communicable diseases such as skin infections, dengue fever, malaria, upper respiratory tract infections (URTI), diarrhea, pulmonary tuberculosis, helminthiasis, leptospirosis, and filariasis. Consequently, interventions that target environmental improvement have become essential components of public health promotion and disease prevention strategies (1). Previous studies have demonstrated that community-based health education—particularly regarding environmental hygiene and waste management—serves as an effective approach to enhance public awareness and promote healthy behavior among rural residents (2,3).

Community participation in environmental health education and related programs is recognized as a key determinant of intervention success. Participatory approaches involving residents in activities such as community workshops, environmental clean-ups, waste management initiatives, and training on eco-friendly practices have been shown to improve knowledge, attitudes, and behaviors that contribute to healthier living environments (4,5).

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Evidence from community-based interventions indicates that interactive educational methods and field-based demonstrations significantly enhance both knowledge and participation levels among target populations (6).

The effectiveness of environmental health programs depends not only on the delivery of information but also on the community's ability to access, understand, appraise, and apply that information—core components of health literacy. The health literacy model proposed by Sørensen et al. (7) identifies four key competencies—access, understanding, appraisal, and application—that collectively determine how effectively communities can act on health-related recommendations. Moreover, environmental health literacy research emphasizes that knowledge alone is insufficient; successful interventions often integrate education, community engagement, and feedback mechanisms that enable residents to make informed decisions about environmental exposures and mitigation practices (8,9).

Field evidence from various outreach and community service programs across Indonesia suggests that strengthening community capacity through participatory education can improve both environmental indicators (such as waste management, sanitation, and household hygiene) and health outcomes, including reduced risk factors for environment-related diseases and increased access to preventive services (10,11). Initiatives such as collective clean-up activities (*gotong royong*), local waste processing projects, recycling education, and the promotion of clean and healthy living behaviors (PHBS) demonstrate the synergy between knowledge enhancement and behavioral change that supports the effectiveness of environmental health programs in rural contexts (12,13).

Despite these positive initiatives, many rural communities in Indonesia continue to face significant challenges, including limited health literacy, low participation in preventive programs, and inadequate waste and sanitation infrastructure. These barriers often hinder the sustained success of environmental health programs. Therefore, it is essential to examine how community engagement in environmental health education influences program effectiveness and outcomes at the local level. Evidence from related studies suggests that active participation—through health education, collective action, and environmental monitoring—can improve hygiene practices, promote the adoption of simple environmental technologies, and enhance overall health literacy (2,7).

However, despite the recognition of community participation as a critical factor, few empirical studies have quantitatively analyzed its direct relationship with the effectiveness of environmental health programs in rural Indonesia. Previous research has primarily focused on descriptive assessments or program implementation narratives, with limited attention to measuring the strength of association between participation and program outcomes. This gap highlights the need for a more rigorous, data-driven examination of how participatory engagement affects the sustainability and impact of environmental health initiatives.

To address this gap, the present study investigates the correlation between community participation in environmental health education and the effectiveness of environmental health programs in rural Indonesia. In contrast to prior studies that relied mainly on qualitative observations or single-case analyses, this research employs a quantitative approach using statistical methods to determine the strength and significance of this relationship. Through this approach, the study contributes new empirical evidence on the role of participatory education in fostering behavioral and environmental improvements, thereby advancing understanding of effective strategies for sustainable rural public health development.

Accordingly, this study, entitled "Assessing the Link between Community Engagement and Environmental Health Program Outcomes in Rural Indonesia," aims to examine the extent to which community participation in environmental health education correlates with improvements in environmental and household health indicators, identify mechanisms—such as enhanced health literacy, collective action, and waste management practices—that mediate the relationship between participation and program outcomes, and provide programmatic recommendations to strengthen participatory environmental health education and community-based interventions in rural Indonesian settings. This evaluative approach is intended to ensure that environmental health programs are not merely informative but genuinely effective in generating measurable behavioral and environmental improvements that contribute to sustainable public health outcomes.

2. Methods

2.1. Study Design

This study adopted a quantitative cross-sectional design to analyze the relationship between community participation in environmental health education and the effectiveness of environmental health programs in improving community cleanliness. This design was chosen because it allows researchers to capture the existing association between variables and measure variations in community participation and program outcomes at a single point in time, providing an efficient snapshot of behavioral and perceptual differences across the population. The design also enables the identification of statistically significant associations without requiring long-term follow-up, which is suitable for community-based studies with limited resources.

2.2. Study Setting and Population

The research was conducted in a rural community in Pangkep Regency, South Sulawesi, Indonesia, where the local government implements the Community-Based Environmental Health Program (*Program Kesehatan Lingkungan*). The study population consisted of permanent residents aged 17 years and older who were aware of and had potential exposure to the program.

A total population sampling method was used to ensure inclusivity and minimize sampling bias, as the target community had a manageable population size. This approach included all 467 eligible respondents, representing a complete enumeration of adults meeting the inclusion criteria. Exclusion criteria included temporary residents and individuals unable to participate in interviews due to health or communication limitations.

2.3. Data Collection Procedure

Data collection took place between July and August 2025 using a structured questionnaire administered through face-to-face interviews conducted by trained enumerators. Prior to data collection, enumerators underwent two days of training covering ethical considerations, informed consent procedures, interview techniques, and the standardized administration of the instrument.

The questionnaire was developed based on relevant literature and validated through expert review by three public health academics and practitioners. A pilot test was conducted on 30 respondents from a neighboring community to assess clarity, reliability, and consistency of responses, with necessary revisions made before the full survey.

The questionnaire consisted of three main sections:

- Sociodemographic information: age and highest education level;
- Independent variable: participation in environmental health education, measured dichotomously (Yes/No); and
- Dependent variable: perceived effectiveness of the environmental health program, assessed through respondents' perception of whether the program improved environmental cleanliness in their neighborhood (Yes/No).

2.4. Data Management and Analysis

Data were double-entered into Microsoft Excel and cross-verified for accuracy before being analyzed using IBM SPSS Statistics version 26.0. The analytical process involved several stages:

- Descriptive analysis was used to summarize demographic characteristics and response distributions using frequencies and percentages.
- Analytical testing applied the Chi-square test of independence to examine the association between participation in health education (independent variable) and program effectiveness (dependent variable).
- Effect size and strength of association were assessed using the Phi coefficient (φ) to interpret the magnitude and direction of the relationship.

The Chi-square test was chosen because both variables were nominal and dichotomous, aligning with the assumptions of the test. A p-value < 0.05 was considered statistically significant, and results were interpreted to determine whether active participation significantly contributed to perceived program effectiveness.

3. Results and Discussion

3.1. Respondent Characteristics

A total of 467 respondents participated in this study, all of whom were permanent residents of rural areas in Pangkep Regency, South Sulawesi, Indonesia. Respondents ranged in age from 17 to 74 years, with the majority belonging to the productive age group (25–55 years). This demographic profile reflects a community capable of active participation in local health and environmental programs.

Educational attainment varied widely, ranging from no formal schooling to master's degree (S2). Most respondents had completed primary or secondary education, while a smaller proportion held tertiary qualifications. This diversity in educational background provides insight into varying levels of health literacy and comprehension regarding environmental issues.

3.2. Participation in Environmental Health Education

Of the 467 respondents, 278 individuals (59.5%) reported participating in environmental health education activities, such as health counseling sessions, community clean-up campaigns, or waste-management workshops. The remaining 189 respondents (40.5%) stated that they had not taken part in such programs. These findings indicate that although community engagement in educational initiatives is relatively strong, a considerable proportion of residents has not yet been reached by ongoing environmental health promotion efforts.

3.3. Effectiveness of Environmental Health Programs

Most respondents perceived the environmental health program as effective in improving sanitation, waste management, and environmental cleanliness in their communities. Participants in health education activities were more likely to report tangible improvements, including cleaner surroundings, enhanced household waste-handling practices, and increased involvement in collective clean-up events. These outcomes suggest that environmental health education has contributed to meaningful behavioral and environmental improvements at the community level.

3.4. Results

Based on the research conducted, data were obtained on the relationship between community participation in environmental health education and the effectiveness of environmental health programs. The following are the results of the cross-tabulation analysis.

Table 1. Relationship between Community Participation in Environmental Health Education and Environmental Health Program Effectiveness in Rural Indonesia

Community Participation	Environmental Health Program Effectiveness				Total	P	φ
	Effective		Non-Effective				
	n	%	n	%			
Attended education	272	97,8	6	2,2	278		
Did not attend education	123	65,1	66	34,9	189	**0.000**	**0.445**
Total	**395**	**84,58**	**72**	**15,41**	**467**		

The results show that among respondents who attended environmental health education activities, 97.8% perceived the program as effective, while only 65.1% of those who did not participate reported the same. The Chi-square test indicated a statistically significant association between participation in health education and program effectiveness ($p = 0.000$), with a moderate positive correlation ($\varphi = 0.445$).

These findings suggest that higher levels of community participation are strongly associated with improved program outcomes. Communities actively engaged in health education activities—such as group discussions, demonstrations, and environmental sanitation campaigns—were more likely to perceive tangible improvements in cleanliness and public health within their surroundings.

3.5. Discussion

Community participation in environmental health education plays a pivotal role in determining the success of public health initiatives at the community level. The findings of this study, conducted in rural areas of Pangkep Regency, South Sulawesi, revealed a positive and statistically significant correlation between community participation and the effectiveness of environmental health education programs ($r = 0.445$, $p < 0.001$). This moderate association indicates that higher levels of community engagement are linked to more effective implementation of environmental health interventions, suggesting that participatory approaches enhance both the reach and impact of public health education efforts.

This finding is consistent with previous research emphasizing that active community involvement significantly enhances the effectiveness of health programs (14). When residents are actively engaged, they transform from passive recipients of information into active participants in collective learning and the adoption of healthy behaviors. Evidence from community service and program evaluation studies supports this result, demonstrating that participatory methods—such as interactive discussions, demonstrations, pre-tests and post-tests, and field-based learning—lead to increased knowledge, participation, and improved environmental management practices (2,4). In the context of rural Indonesia, participatory and interactive health education helps strengthen communities' ability to access, comprehend, and apply environmental health information, thereby contributing to improved program outcomes.

Furthermore, consistent community participation in health education activities has been shown to enhance knowledge, attitudes, and practices related to sanitation and hygiene. However, program success is not determined solely by the quality of educational materials; it also depends on social interactions between facilitators and participants, the adequacy of facilities and infrastructure, and residents' motivation to engage (15–17). External factors also play a critical role in influencing program outcomes. Support from health professionals, local authorities, and non-governmental organizations (NGOs) has been found to significantly affect participation levels. Educational activities that involve the community directly—such as lectures, group discussions, and hands-on demonstrations—are particularly effective in promoting engagement and improving results (16,18). These participatory approaches not only strengthen understanding but also foster a sense of shared responsibility for maintaining environmental cleanliness (19).

Active community engagement also contributes to broader public health outcomes, such as the reduction of diarrhea, stunting, and other environment-related diseases. Studies have shown that participation in health programs correlates with lower stunting prevalence and increased community health awareness (20–22). Community-based learning through environmental health education improves residents' knowledge and attitudes toward sanitation, access to clean water, and household waste management.

Despite these positive findings, several challenges persist. Limited public understanding of the importance of participation, low motivation, and inadequate support from local authorities or NGOs can hinder the long-term effectiveness of environmental health programs (23–25). To address these barriers, comprehensive strategies are needed. These include strengthening community empowerment initiatives, building capacity among educators and facilitators, and implementing continuous, participatory campaigns to foster sustained community engagement in environmental health improvement efforts.

Conclusions

This study demonstrated a significant positive correlation between community participation in environmental health education and the effectiveness of environmental health programs in rural Indonesia ($r = 0.445$, $p < 0.001$). Higher participation levels were associated with improved environmental cleanliness and better public health outcomes, highlighting that active community engagement is a key factor in program success and sustainability.

Despite these positive outcomes, several challenges persist, including limited community awareness, inconsistent institutional support, and inadequate infrastructure. Addressing these barriers requires stronger intersectoral collaboration among health officers,

local governments, and community organizations to ensure equitable participation and long-term sustainability.

Practically, the findings indicate that strengthening participatory education models can enhance local ownership, improve sanitation and hygiene behaviors, and promote more efficient resource use. Future research should adopt longitudinal or comparative designs to assess long-term impacts and evaluate the scalability of community-based interventions across diverse rural contexts.

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Conflicts of Interest

The authors declare no conflict of interest

References

1. Zulkifli Z. Penyuluhan Kesehatan Penyakit Berbasis Lingkungan Dan Pemeriksaan Kesehatan GRATIS. BBM. 2024;
2. Prasmoro AV, Supratman J, Sitorus H, Spalanzani W. Penyuluhan Kesadaran Masyarakat Berwawasan Lingkungan Di Desa Sukatenang Kecamatan Sukawangi Kabupaten Bekasi. Jurnal Sains Teknologi Dalam Pemberdayaan Masyarakat. 2022;
3. Junaidi I, Hefdiyah. Bersama Penyuluhan Pentingnya Menjaga Lingkungan Sekitar Danmpembuatan Kerajinan Dari Botol Bekas. Ja. 2023;
4. Manyullei S, Fikri M, Arsyah H, Nathalinri E, Jayanti AN, Andryany R, et al. Penyuluhan Dan Pelatihan Pengolahan Sampah Menjadi Ekoenzim Di Kelurahan Ma'rang Kabupaten Pangkep. Jurnal Pemberdayaan Komunitas Mh Thamrin. 2024;
5. Aslinda A, Zakī A, Sutamrin, Arwadi F, Ikram M, Marselina L, et al. Program Kerja Gotong Royong Di Desa Jenetaesa Kecamatan Simbang. C-JCosDev. 2025;
6. Wiratama R. Penyuluhan Pengelolaan Sampah Rumah Tangga Di Rt 02 Kampung Petir, Desa Cikunir, Kecamatan Singaparna Tahun 2025. Jurnal Abdimas Kesehatan Tasikmalaya. 2025;
7. Sørensen K, den Broucke S Van, Fullam J, Doyle G, Pelikan JM, Słońska Z, et al. Health Literacy and Public Health: A Systematic Review and Integration of Definitions and Models. BMC Public Health. 2012;
8. Gray K. From Content Knowledge to Community Change: A Review of Representations of Environmental Health Literacy. Int J Environ Res Public Health. 2018;
9. Ramírez-Andreotta MD, Brody JG, Lothrop N, Loh M, Beamer PI, Brown P. Reporting Back Environmental Exposure Data and Free Choice Learning. Environmental Health. 2016;

10. Darisman EK, Firdausi AR, Pramudya KC, Ardhi NM, Putri DS, Amalia H, et al. Sosialisasi Darkes (Sadar Kesehatan) Untuk Warga Desa Karangpuri Kecamatan Wonoayu. Ic. 2025;
11. Wahyudi W, Salianto S, Gunawan AN, Rangkuty MP, Fauziah N, Asti RD, et al. Identifikasi Dan Intervensi Masalah Kesehatan Melalui Pengalaman Belajar Lapangan (PBL) Di Desa Petatal, Kecamatan Datuk Tanah Datar, Kabupaten Batubara. Ahmar Metakarya Jurnal Pengabdian Masyarakat. 2025;
12. Fauziyah N, Sarjiyanto S, Wardhana AW, Ariani AO, Azizah FR, Wijaya NK, et al. Dari Limbah Jadi Manfaat: Lilin Aromaterapi Dari Minyak Jelantah Dan Edukasi DBD. Jurnal Pengabdian West Science. 2025;
13. Royan Muntaha AS, Kurniasih A, Novianty A, Pangestu FJ, Nabilah J, Ramadhan MF, et al. Pembuatan Bak Sampah Sebagai Bentuk Peduli Lingkungan Di Desa Kamasan Kecamatan Banjaran Kabupaten Bandung. Abadi. 2024;
14. Haryati H. Efektivitas Penyuluhan Kesehatan Dan Aksi Masyarakat Dalam Upaya Penerapan Perilaku Hidup Bersih Dan Sehat Di Lingkungan Masyarakat Kelurahan Kambu Kota Kendari. JPM. 2022;
15. Arif A. Analisis Faktor Yang Berhubungan Dengan Penerapan 5 Pilar STBM. Jurnal Kesehatan Global. 2024;
16. Johan H. Tingkat Partisipasi Masyarakat Dalam Promosi Kesehatan Sebagai Upaya Pencegahan Diare Pada Anak Balita. Sebatik. 2024;
17. Rivanica R, Pratiwi A. Faktor-Faktor Yang Berhubungan Dengan Partisipasi Ibu Dalam Penimbangan Bayi Dan Balita Ke Posyandu. Jurnal Aisyiyah Medika. 2021;
18. Purnomo SD, Winarto H, Kencana H. Pengelolaan Sampah Berbasis Jiwa Gotong Royong. Wikuacitya Jurnal Pengabdian Kepada Masyarakat. 2022;
19. Yazid Y, Alhidayatillah N. Partisipasi Masyarakat Dalam Pemberdayaan Lingkungan. Jurnal Dakwah Risalah. 2018;
20. Anurogo D, Habibi H, Ximenis VD, Wahidin W. Analisis Implementasi Kebijakan Kesehatan Dan Partisipasi Masyarakat Dalam Mengurangi Angka Stunting Di Jakarta. Jurnal Multidisiplin West Science. 2024;
21. Riyanto M, Kovalenko V. Partisipasi Masyarakat Menuju Negara Kesejahteraan: Memahami Pentingnya Peran Aktif Masyarakat Dalam Mewujudkan Kesejahteraan Bersama. Jurnal Pembangunan Hukum Indonesia. 2023;
22. Pujilestari A, Rejeki M, Hapsari MS, Tyas AK, Rahim F. Peran Masyarakat Dalam Kontrol Mutu Pelayanan Kesehatan Di Mojosongo, Surakarta. Sentra Dedikasi Jurnal Pengabdian Masyarakat. 2023;
23. Hariani H, Ramlah R. Pelaksanaan Program Penanggulangan Diare Di Puskesmas Matakali. J-Kesmas Jurnal Kesehatan Masyarakat. 2019;
24. farihin AU. Meningkatkan Kesadaran Lingkungan Melalui Edukasi Dan Partisipasi Masyarakat. Jurnal Mujahada. 2023;

25. Apay F, Manangsang F, V. Purba ER, Gentidatu S, Swastika IK, Rophi KH, et al. Peningkatan Derajat Kesehatan Masyarakat Di Kampung Ifar Besar Papua Melalui Penyuluhan Malaria, Stunting, Scabies, Asam Urat, Dan TB. Jurnal Masyarakat Madani Indonesia. 2024.