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Dengue Fever Prevention Strategy in Puuk Village, Pidie Regency, Aceh Province

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Abstract: This program aims to evaluate the effectiveness of community empowerment as a strategy for preventing Dengue Fever (DBD) in Puuk Village, Aceh. A mixed-method approach was applied, combining quantitative surveys with qualitative techniques such as focus group discussions and in-depth interviews. The intervention program included training, counseling, environmental clean-ups, and participatory workshops. Results showed a significant increase in community knowledge and awareness regarding DBD, accompanied by improved preventive behaviors such as eliminating mosquito breeding sites and using repellents. Cross-sectoral coordination between health workers, community leaders, and local organizations further enhanced program outcomes, although limited resources and uneven information access remained challenges. The findings highlight that participatory empowerment can effectively change health behaviors and reduce DBD risk. The study implies that this model could be replicated in other regions, emphasizing the importance of collaboration, innovation, and sustainability in community-based health interventions.

Keywords: Community Empowerment, Dengue Fever (DBD), Disease, Prevention, Puuk Village Aceh.

Introduction

Dengue Hemorrhagic Fever (DHF) is a disease caused by the dengue virus (DENV) and transmitted through the bites of Aedes mosquitoes, particularly Aedes aegypti and Aedes albopictus (Ghodiq Ufthoni et al., 2022). Although this disease was once recognized primarily as a health issue in tropical regions, the spread of DHF has increased in various parts of the world due to climate change and rapid urbanization. In Indonesia, particularly in Aceh Province, DHF cases have become a serious concern because environmental conditions favor the proliferation of mosquito populations that transmit the disease.

In Puuk Village, Pidie District, Pidie Regency, Aceh Province, the development of community service activities has become one of the strategic efforts to enhance dengue prevention behavior. The community empowerment approach in this context is not only aimed at increasing knowledge and awareness about DHF but also at encouraging participation and fostering local ownership of initiatives to control mosquito vectors. Active community involvement, from the planning process to the implementation of prevention programs, is considered a key factor in achieving long-term success in reducing DHF incidence.

Community empowerment has proven effective in various parts of the world, as demonstrated in a case study in Swat, Pakistan (Khan et al., 2024), where active community participation in prevention campaigns led to more optimal control of dengue transmission. Empowerment models that emphasize participatory approaches—including training, health education, and the establishment of local discussion groups—serve as the foundation for successful interventions. By

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integrating epidemiological knowledge, risk-mapping techniques, and community empowerment methodologies, dengue prevention efforts in Puuk Village are expected to generate significant impacts in addressing this disease.

The dengue virus belongs to the genus Flavivirus and is one of the arboviruses with the greatest impact on human health (Mahawan et al., 2024). DHF transmission occurs through the bites of Aedes mosquitoes, particularly Aedes aegypti, which has a strong preference for habitats in densely populated residential areas. Environmental factors such as weather conditions, stagnant water, and urbanization strongly support the proliferation of these mosquitoes (Aqwam et al., 2023). Studies have shown that climate change, characterized by extreme rainfall patterns and rising temperatures, can expand the distribution of vectors, thereby significantly increasing the risk of DHF transmission (Rahmasari et al., 2025);(Prambudi et al., 2023); (Khairinnisa et al., 2025) Through this activity, the implementation of community empowerment strategies will be examined to assess how they can enhance dengue prevention behaviors.

Method

This activity employed a mixed methods approach, combining qualitative and quantitative techniques to evaluate the effectiveness of the community empowerment program in improving dengue prevention behaviors in Puuk Village, Aceh.

1. Qualitative Approach The qualitative approach was applied to explore community perceptions, attitudes, and experiences related to the dengue prevention program. Data collection techniques included Focus Group Discussions (FGDs) to gather information through group discussions involving health cadres, community leaders, and local residents. In-depth interviews were also conducted with key stakeholders and health program implementers to better understand the challenges and successes of the empowerment program.
2. Quantitative Approach On the quantitative side, data were collected through questionnaires distributed to residents of Puuk Village. The variables measured included the level of knowledge about dengue fever; attitudes toward preventive practices, such as eliminating stagnant water and using repellents; and the frequency of participation in preventive activities, such as community health posts (posyandu lingkungan) and health education sessions. The questionnaires also assessed behavioral changes before and after the implementation of the empowerment program. These data were analyzed statistically to identify correlations between increased community capacity and the reduction of dengue transmission risks.
3. Community Empowerment Program Implementation Process The community empowerment program in Puuk Village was designed based on several key stages, namely:
   1) Preparation and Engagement: Involving all local stakeholders and conducting initial socialization on the importance of dengue prevention.
   2) Needs Assessment: Analyzing environmental conditions, community knowledge levels, and potential risks of dengue transmission.
   3) Planning and Action Plan: Developing intervention programs that include training, education, and awareness campaigns.
   4) Program Implementation: Carrying out empowerment activities such as workshops, environmental clean-ups, and the installation of risk-monitoring tools.
   5) Evaluation and Termination: Assessing the program's effectiveness and providing feedback for continuous improvement.

The diagram below illustrates the overall flow of the community empowerment process:

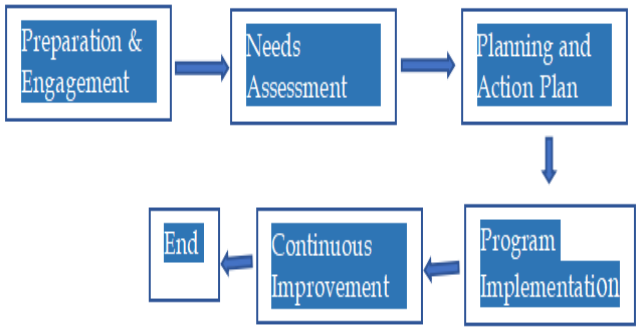

Figure 1. Flow of the community empowerment process in dengue prevention efforts in Puuk Village, Aceh Province.

The diagram illustrates the systematic stages of the community empowerment process implemented in Puuk Village to strengthen dengue prevention behaviors. The process begins with Preparation and Engagement, where stakeholders and community members are involved through socialization and initial discussions on the importance of dengue control. This is followed by a Needs Assessment, which identifies environmental conditions, community knowledge levels, and potential risk factors for dengue transmission. Based on this assessment, a Planning and Action Plan is developed, integrating training sessions, health education, and preventive interventions tailored to local needs. The next stage is Program Implementation, which includes workshops, environmental clean-up activities, and the installation of risk-monitoring tools. Finally, the process emphasizes Continuous Improvement, where the

program is evaluated, feedback is collected, and adjustments are made to ensure sustainability and long-term effectiveness.

Result and Discussion

1. Improvement of Knowledge and Awareness

The initial survey results conducted in Puuk Village indicated that the level of knowledge regarding dengue fever increased significantly after the implementation of the empowerment program. Prior to the intervention, many residents had limited understanding of dengue symptoms, its mosquito vectors, and proper prevention measures. However, following health education and training activities, community awareness of the importance of eliminating mosquito breeding sites and adopting preventive practices improved substantially. The following table summarizes the comparison of community knowledge and awareness levels before and after the program implementation:

Table 1. Comparison of Community Knowledge and Awareness in Dengue Prevention in Puuk Village

Measured Aspect	Before Intervention	After Intervention
Knowledge of Dengue Fever	Low	High
Understanding of Dengue Symptoms	Low	High
Preventive Practices	Minimal	Improved
Participation in Activities	Low	Active

Research shows that increasing knowledge through educational activities has a direct impact on changes in community behavior. This finding is consistent with community empowerment studies conducted in several regions, which emphasize that education and health promotion are key factors in controlling the spread of dengue fever (Mangunsari et al., 2025); (Rustu Sawaluddin et al., 2024);(Rahmasari et al., 2025).

2. Changes in Preventive Behaviors

The empowerment program in Puuk Village successfully encouraged residents to actively engage in preventive actions, such as; a) Cleaning Water Storage Containers, residents routinely cleaned and emptied potential mosquito breeding sites, b) Use of Repellents and Protective Measures, the increased use of repellents and protective clothing among residents served as a key indicator of the program's success., c) Environmental Health Campaigns, community clean-up activities (gotong royong) in residential areas increased significantly, (Farich et al., 2020), (Arfan et al., 2024), (Lusno et al., 2024).

Survey results indicated that these behavioral changes had a positive correlation with the decline in dengue cases during the observation period. Field data also confirmed that active community involvement enhanced the effectiveness of preventive interventions, aligning with the participatory approach recommended in various community empowerment studies.

3. Coordination and Collaboration

One of the key drivers of positive change was strong coordination among various stakeholders, including health officials, community leaders, and non-governmental organizations. This cross-sectoral collaboration helped optimize available resources and ensured that information and prevention strategies were effectively disseminated to all community members. Studies from different regions have shown that the involvement of government institutions and community leaders plays a crucial role in the success of dengue prevention programs (Dewi, 2020); (Hossain et al., 2024); (Rachman et al., 2025). In Puuk Village, effective coordination fostered synergy in program implementation, enabling collective solutions to overcome various obstacles.

4. Barriers and Constraints

Despite the significant improvements in knowledge and preventive behaviors, several challenges remain to be addressed. These include limited access to information, as not all residents—particularly those in remote rural areas—received adequate knowledge about dengue (Ester Sitorus et al., 2025). Another challenge is limited resources, which pose a threat to program sustainability (Syalfina et al., 2025). In addition, a lack of coordination among institutions during the early stages of the program hindered the speed of information dissemination and preventive actions. These findings highlight the need for continuous improvement in program implementation mechanisms, with a strong emphasis on incorporating community feedback to address existing constraints.

5. Community Empowerment Implementation Strategy in Puuk Village

Based on the needs analysis and initial evaluation, the community empowerment strategy for dengue prevention in Puuk Village was designed through several concrete steps that integrate theory and practice. This strategy encompasses educational, participatory, and collaborative approaches, developed to ensure long-term sustainability. Education serves as the fundamental

basis of empowerment. The educational approach can be carried out through; (1) Regular Health Education Sessions: Conducting routine sessions on dengue at the village hall and posyandu, covering recognition of symptoms, transmission mechanisms, and preventive measures. (2) Interactive Workshops: Organizing workshops that include prevention simulations, proper use of repellents, and the elimination of potential mosquito breeding sites. (3) Utilization of Local Media: Disseminating accurate and accessible information through posters, banners, and local social media platforms. These approaches have been implemented in previous initiatives and proven effective, (Suryanegara et al., 2023); (Fortuna et al., 2025), (Lwin et al., 2019).

The participatory approach aims to enhance active community involvement in environmental management by engaging all residents. Several initiatives that can be applied include: (1) Clean Village Campaigns: Mobilizing regular community clean-up activities (gotong royong) to clean public areas and eliminate stagnant water sources that serve as mosquito breeding grounds. (2) Formation of Special Task Groups: Establishing volunteer teams responsible for monitoring the environment and reporting potential breeding sites to health officials.(3) Provision of Prevention Tools and Materials: Distributing protective equipment and repellents, as well as providing training on effective cleaning techniques for households and public spaces. Table 2 presents a comparison between traditional approaches and participatory empowerment approaches in the context of environmental management:

The strategies are expected to create an environment that supports mosquito population control and strengthens the community's sense of ownership over dengue prevention programs. Another important approach is collaboration between the government, health institutions, and the community, which is essential for building an integrated dengue prevention system (Sarker et al., 2024). Several collaborative steps that can be reinforced include; (1) Joint Action Plan Development: Formulating an action plan that involves representatives from all stakeholders to ensure synergy in program implementation. (2) Integrated Monitoring and Evaluation: Conducting regular meetings to jointly evaluate program progress and identify solutions to emerging challenges. (3) Empowerment through Joint Funding: Optimizing available resources through cooperation between local governments and non-governmental organizations to ensure program sustainability.

Table 2. Comparison of Environmental Management Strategies in Dengue Prevention

Aspect of Approach	Traditional Approach	Participatory Empowerment Approach
Community Involvement	Limited, mainly dependent on health officials	Active participation of all community members
Information Dissemination	One-way communication through officials	Two-way communication with community feedback
Program Sustainability	Short-term, often project-based	Long-term, supported by local ownership and initiatives
Monitoring and Evaluation	Conducted by external parties only	Joint monitoring involving health cadres and residents

The utilization of technology and innovation is also indispensable in implementing community-based programs. In the digital era, technology can be leveraged to enhance the effectiveness and efficiency of dengue prevention initiatives (Daswito et al., 2024). Several innovations that could be applied in Puuk Village in the future include: (1) Mobile Applications for Monitoring: Developing applications that enable residents to report mosquito-prone sites in real time to health officers. (2) Risk Mapping Systems: Employing geographic information system (GIS) technology to identify high-risk areas for dengue transmission and prioritize interventions. (3) Online Education Platforms: Providing educational materials in the form of videos, articles, and webinars that are easily accessible to the wider community.

6. Challenges and Recommendations

Several challenges emerged during the implementation of the community empowerment program in Puuk Village, including limited resources, such as insufficient funding and inadequate supporting facilities to ensure simultaneous program execution. Variations in the community's capacity to absorb health information, as well as the lack of early coordination between government agencies, health institutions, and the community, also contributed to delays in the application of preventive measures.

To address these challenges, several strategic recommendations are proposed. First, leveraging information technology—such as mobile applications and online platforms—can bridge information gaps. Second, implementing regular training programs for health cadres and community members is essential to strengthen counseling and dengue prevention capabilities. Third, enhancing coordination among government bodies, NGOs, and academic institutions can help develop joint action plans and ensure regular

evaluations to maintain sustainability and program effectiveness. Establishing clear performance indicators and conducting periodic evaluations will also help identify both achievements and areas requiring improvement. Moreover, involving the community from the planning to the implementation stage fosters a sense of ownership and accountability for the success of the intervention.

The improvement of dengue prevention behavior in Puuk Village, Aceh, through community empowerment has demonstrated promising results. This initiative represents a comprehensive intervention model that integrates epidemiological knowledge, active community participation, and technological innovation. By prioritizing a participatory approach, the program not only increases awareness and knowledge but also drives fundamental behavioral changes to reduce the spread of dengue.

Community empowerment as a dengue prevention strategy has shown great potential in transforming behavior and enhancing the quality of life in Puuk Village. The success of this program provides tangible evidence that with knowledge, collaboration, and collective commitment, complex public health challenges can be addressed through a holistic and sustainable approach. Through integrated efforts and strong commitment, it is expected that the Puuk Village community empowerment model can be replicated in other regions with similar conditions. Continuous implementation and regular evaluation are key to ensuring that all segments of society can actively participate in dengue prevention and maintain a healthier quality of life. Thus, this study highlights the importance of collaboration, innovation, and community empowerment as the foundation for achieving successful dengue prevention programs in Aceh and other dengue-prone regions.

Conclusion

Community empowerment in Puuk Village, Aceh, has demonstrated promising outcomes in dengue prevention. The integrated approach—combining education, participation, collaboration, and innovation—proved effective in increasing awareness and fostering long-term behavioral change. The program illustrates that with shared knowledge, collaboration, and commitment, complex public health problems such as dengue can be addressed holistically and sustainably. The Puuk Village model offers a replicable framework for other dengue-prone regions, emphasizing that sustainable implementation and regular evaluation are crucial to long-term success. This study underscores the importance of community empowerment, innovation, and stakeholder collaboration as foundational elements in preventing dengue fever and improving public health in Aceh and beyond.

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References

Ahmad, A., & Fahrurrahman, M. (2025). Edukasi TP PKK dan Tokoh Masyarakat dalam Pencegahan Demam Berdarah. Jurnal Pengabdian Masyarakat Cendikiaenius, 2(2), 150-158.

Arfan, I., Sulistyorini, L., Sulistyowati, M., Syahrul, F., Junaidi, H., & Rizky, A. (2024). Benefits and barriers of community participation in dengue control: A systematic review. African journal of reproductive health, 28(10), 482-498.

Arifin, A. Y., & Mahendrawan, A. D. (2025). Inovasi Dan Edukasi Kesehatan Dalam Mitigasi Penyakit Dan Peningkatan Kualitas Lingkungan Di Kelurahan Tanjung Karang Permai Kota Mataram. Majalah Ilmiah Pelita Ilmu, 8(1), 72-89.

Aristawidya, K., & Widowati, N. (2025). Peran Stakeholder Dalam Upaya Menurunkan Kasus Demam Berdarah Dengue Di Kecamatan Pasar Rebo, Kota Jakarta Timur. Journal of Public Policy and Management Review, 14(2), 117-130.

Asryadin, A., Aqwam, A., Khairunnisa, R., Endang, H. K., Rosita, R., Annas, F., & Hasan, H. (2023). Dengue Hemorrhagic Fever in Bima City: A Study. Jurnal Penelitian Pendidikan IPA, 9(6), 4869-4879.

Dewi, B. G., & Ma'ruf, M. F. (2021). Peran Pemerintah Daerah Dalam Pengendalian Penyakit Demam Berdarah Dengue (Dbd) Di Kota Semarang. Publika, 9(3), 283-294.

Farich, A., Lipoeto, N. I., Bachtiar, H., & Hardisman, H. (2020). The effects of community empowerment on preventing dengufever in Lampung Province, Indonesia. Open Access Macedonian Journal of Medical Sciences, 8(E), 194-197.

Firmansyah, A., Altrisan, R. R., Salsabillah, N., & Rahmania, F. F. (2025). Strategi Pemberdayaan Komunitas dalam Mitigasi Demam Berdarah: Edukasi dan Monitoring Jentik Nyamuk di Kelurahan Mangunsari, Gunungpati. Solidaritas:Jurnal Pengabdian, 5(1), 61-70.

Fitria, A., & Samudra, G. (2025). Edukasi Pemberantasan Sarang Nyamuk (PSN) Sebagai Upaya Pencegahan Demam Beradarah Dengue Di Kelurahan Kejambon Kecamatan Tegal Timur Kota Tegal. JABI: Jurnal Abdimas Bhakti Indonesia, 6(1), 38-47.

Fortuna, C., & Mandira, I. M. C. (2025). Optimalisasi Ovitrap Dalam Mendukung Program 3R Untuk Pengelolaan Sampah dan Pengurangan Risiko DBD. Dharma: Jurnal Pengabdian Masyarakat, 5(2), 311-324.

Khairinnisa, K., Fauzi, Y., & Nugraheni, E. (2025). Analisis Spasio-Temporal Kondisi Iklim dan Jumlah kejadian Demam Berdarah Dengue (DBD) Tahun 2012-2021 di Bengkulu.Jurnal Kesehatan Lingkungan Indonesia, 24(2), 136-144.

Khan, N., Ullah, H. G., Kashif, M., Zeeshan, M., & Muhammad, W. (2024). Knowledge and Practice of Nurses Regarding Dengue Fever and Its Prevention in District Swat. National Journal of Life and Health Sciences, 3(1), 5-13.

Lusno, M. F. D., Haksama, S., Yudhastuti, R., Zubaidah, S., Al Mamun, A., Tarawally, A., ... & Nugroho, H. S. W. (2024). The need for active and integrated involvement of the community and health professionals in the prevention and control of dengue hemorrhagic fever in Indonesia. Pan African Medical Journal, 47(1).

Lwin, M. O., Sheldenkar, A., Panchapakesan, C., Ng, J. S., Lau, J., Jayasundar, K., ... & Wimalaratne, P. (2019). Epihack Sri Lanka: development of a mobile surveillance tool for dengue fever. BMC medical informatics and decision making, 19(1), 111.

Mahawan, Y. F., Ayyasi, Q. S., Yusuf, M., Salsabilla, A., Hutami, N. P., & Ichsan (2024). Survey Larva Dan Penyuluhan Keluarga Tentang Pembasmian Jentik Nyamuk Sebagai Upaya Pencegahan Dbd Di Banyudono Boyolali. Jurnal Pengabdian Masyarakat Medika, 66-73.

Prambudi, M. R. M., Kurniawan, V. R., Hidayat, D. D., Faridz, H. M., & Herbawani, C. K. (2023). Studi Literatur: Faktor Perubahan Iklim dan Kaitannya dengan Demam Berdarah Dengue (DBD) di Indonesia. Jurnal Medika Malahayati, 7(3), 766-778.

Putra, A. P., Widowati, N., & Maesaroh, M. (2025). Kinerja Kader Dalam Penanggulangan Demam Berdarah Dengue (Dbd) Di Kelurahan Sendangmulyo. Journal of Public Policy and Management Review, 1 4(3), 154-170.

Rahmasari, F. F., Kurniasari, F., Bachtiar, A., & Candi, C. (2025). Tinjauan Sistematis Dampak Perubahan Iklim terhadap Kejadian Penyakit Demam Berdarah Dengue (DBD) di Asia Tenggara: Analisis Artikel Tahun 2016-2025. Sehat Rakyat: Jurnal Kesehatan Masyarakat, 4(3), 809-821.

Samosir, K., Ningsih, T. A., & Kaliky, M. F. (2024). Pengembangan Aplikasi Android CIBERNATIK untuk Mendukung Pengendalian Demam Berdarah Dengue Berbasis Pemberdayaan dan Teknologi Informasi. Jurnal Kesehatan Terpadu (Integrated Health Journal), 15(2), 77-88.

Sarinah, S., Raharjo, S., Leomo, S., Tunda, A., Indarsyih, Y., Tuheteru, F. D., ... & Mukmin, N. A. (2024). Pemberdayaan Masyarakat Pesisir Melalui Pembuatan Lilin Aroma Terapi Sebagai Upaya Pencegahan Dbd Di Desa Bokori Kec. Soropia Kab. Konawe Prov. Sulawesi Tenggara. Jurnal Pepadu, 5(4), 754-760.

Sarker, R., Roknuzzaman, A. S. M., Haque, M. A., Islam, M. R., & Kabir, E. R. (2024). Upsurge of dengue outbreaks in several WHO regions: Public awareness, vector control activities, and international collaborations are key to prevent spread. Health Science Reports, 7(4), e2034.

Sawaluddin, M. R., & Lidayanti, S. (2024). Pencegahan DBD dengan Penyuluhan Hidup Bersih dan Sehat di Kecamatan Tawang Tasikmalaya Jawa Barat. Proficio, 5(2), 920-932.

Sitorus, M. E. J., Purba, I. E., Munthe, S. A., Harefa, S. H., & Sitompul, W. N. (2025). Pencegahan Penyakit DBD Melalui Pemberdayaan Masyarakat Dengan Komunikasi Dan Edukasi Di Desa Tanjung Beringin I Kabupaten Dairi. Jurnal Abdimas Mutiara, 6(1), 176-185.

Suryanegara, W., Reviani, N., Simarmata, V. P. A., Sitompul, Y. R., & Sanggul, A. R. (2023). Pelayanan Kesehatan Masyarakat Melalui Penyuluhan tentang Demam Berdarah Dengue (DBD) di Kecamatan Rancakalong, Sumedang, Jawa Barat. *JURNAL ComunitÃ Servizio: Jurnal Terkait Kegiatan Pengabdian kepada Masyarakat, terkhusus bidangTeknologi, Kewirausahaan dan Sosial Kemasyarakatan*, *5*(2), 1538-1550.

Syalfina, A. D., Mafticha, E., Fardiansyah, A., Syurandhari, D. H., & Saputra, M. H. (2025). Peningkatan Pengetahuan Kader Sebagai Upaya Pencegahan Penyakit Demam Berdarah Dengue. Community Care: Jurnal Pengabdian Masyarakat, 1(1), 16-23.

Ufthoni, G., Widjanarko, B., Kartini, A., Joko, T., Hakam, M. A., & Putro, H. E. S. (2022). Edukasi Pencengahan Penyakit Demam Berdarah Dengue. Jurnal Pengabdian Kesehatan, 5(2), 121-129.