



# Health Promotion To Control Dengue Hemorrhagic Fever: A Study in Rural Area of Sleman Regency Indonesia

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## ABSTRACT

**Background:** The number of dengue cases in Indonesia continues to increase. Yogyakarta is one of the regions with an Incidence higher than the national target. Many people in Pulerejo Bokoharjo Sleman have contracted DHF during 2024. DHF cases that are late in receiving treatment can cause fatalities such as death, so prevention and control efforts need to be made.

**Objective:** To increase community knowledge in the prevention and control of DHF through health promotion and describe the supporting factors for the implementation of health promotion programs.

**Methods:** This study used a quasi-experimental method with a pre-test and post-test design. Respondents were 30 health cadres. Health interventions through health promotion using group-based methods, coordinating with policy makers at the Prambanan Health Center and Bokoharjo Village, Sleman Yogyakarta. In addition, an approach was also made with the Pulerejo community to organize health promotion.

**Results:** There was an increase of community knowledge in DHF control efforts with a score of 2.50 to 2.90 and statistically related with a p-value of 0.000. Supporting factors for the implementation of health promotion programs include the enthusiasm of stakeholders such as village representatives, community health center officers, jumantik cadres, and residents of Pulerejo Hamlet in attending educational activities.

**Conclusion:** Health education is one of the health promotion methods that has been proven effective in increasing community knowledge in preventing and controlling dengue fever. Stakeholder and community support is key to the success of health promotion programs.

## 1. Introduction

Dengue fever (DHF) is a disease caused by the dengue virus that is transmitted to humans through the bites of *Aedes Aegypti* and *Aedes Albopictus* mosquitoes. Indonesia is an endemic area that is widespread throughout the country(1). *Aedes Aegypti* mosquitoes are commonly found in homes, schools, and other public places, putting people at risk of contracting dengue fever(2). Unlike other types of mosquitoes that roam at night, *Aedes Aegypti* mosquitoes are more likely to roam in the morning from 8 - 10 am and in the afternoon from 3 - 5 pm(3).

The epidemiology of dengue generally occurs in tropical and sub-tropical urban areas. Data from around the world shows that Asia ranks first in the number of DHF patients each year, and the World Health Organization (WHO) lists Indonesia as the country with the highest number of DHF cases in Southeast Asia(4). Since it was first discovered in Indonesia in 1968, the disease has spread rapidly in various regions, from 2 provinces and 2 cities to 32 provinces (97%) and 382 (77%) districts/cities in 2009, the number of people infected has also increased from 58 in 1968 to 158,912 in 2009(5). DHF

cases in the Special Region of Yogyakarta (DIY) from year to year are still high, Sleman Regency is one of the areas with high DHF cases. In 2019 there were 728 cases with 1 death in the hospital, in 2019 DHF cases increased quite high compared to the previous year (2018) which was 144, but all cases could be treated 100%. The incidence rate reached 67.97%, which is higher than the target of 50% (6). One of the areas in Sleman, namely Pulerejo Hamlet, Bokoharjo Village, precisely in the Neighborhood Association (RT) 7 area, found 2 cases of DHF in May 2024.

This paper aims to describe changes in community knowledge in efforts to prevent and control dengue through health promotion with poster and tote bag media and describe the supporting factors for the implementation of the health promotion program.

## 2. Method

This study used a quantitative method with a quasi-experimental design Pretest Intervention conducted through health education on the prevention and control of DHF. Pre-intervention and post-intervention pretests were conducted. The research location was Pulerejo hamlet, Bokoharjo village, Prambanan sub-district, Sleman regency, Yogyakarta on July 12, 2024. The population is the number of families with dengue cases, namely 150 families. The minimum sample size was 22 families obtained using the Slovin formula with a 20% error rate, and the sample size was 30 people. The sample used produced paired data so that the bivariate data analysis used the Paired Samples T- Test (7,8).

## 3. Result

The education level of respondents in Pulerejo Hamlet mostly had a high school education totaling 16 people (53.3%) and the least educated D3 totaling 2 people (6.7%). Community knowledge about dengue prevention before being given health education reached a good level of knowledge of as many as 16 people (53.3%). Meanwhile, there was an increase in the knowledge of respondents after being given education, the majority of which were in the good category, namely 27 people (90%). As described in Table 1 below.

**Table 1.** Respondent Characteristics (N=30)

Education level	Number	%
Elementary	3	10
Junior High School	5	16,7
Senior High School	16	53,3
D3	2	6,7
S1	4	13,3
<b>Knowledge before intervention</b>		
Less	1	3,3
Enough	13	43,3
Good	16	53,3
<b>Knowledge after intervention</b>		
Less	0	0
Enough	3	10
Good	27	90

Source: Primary Data, 2024

There was an increase in community knowledge before and after education about DHF. The average score of respondents' knowledge before education was 2.50, while after education it increased to 2.90. Furthermore, the Pair T-test results obtained a P value of 0.000, so it can be concluded that there is a difference in respondents' knowledge about Dengue Fever (DHF) before and after education. Therefore,

it can be concluded that respondents were able to understand the material presented by the resource person well. This is shown in Table 2.

**Table 2.** Knowledge level before and after health education program (N=30)

Knowledge	Mean	N	SD	P - Value
Pretest	2.50	30	0.572	0.000
Posttest	2.90	30	0.305	

Source: Primary Data, 2024

#### 4. Discussion

Health promotion for the prevention and control of dengue fever includes a series of activities that begin with a need assessment consisting of interviews with village officials, and health workers from Prambanan Community Health Center and reviewing secondary data in the form of local health profiles. Then designing a health promotion program based on the priority problems found, namely DHF. Health education strategies on dengue control were delivered using lecture and discussion methods. The materials covered the definition, causes, risk factors, signs and symptoms, and prevention of Dengue Fever (DHF). How to prevent Dengue Fever (DHF) was the main focus.

The entire community who participated in this activity was very enthusiastic and very active and paid close attention to the health messages delivered by the resource person. In addition, through this interactive discussion forum, the community had the opportunity to share experiences, ask questions, and discuss their understanding of health topics. These interactions between participants can provide new perspectives and additional information that can enrich knowledge. During the discussion session, the community was very active in asking questions, which proves that the community is very interested in knowing more about disease prevention. DHF. With good knowledge, individuals can be more aware of the risk factors for DHF, the symptoms of DHF, and how to prevent DHF. This education is aimed at the wider community to prevent an overall increase in the prevalence of this disease, especially in Pulerejo hamlet. The health promotion media used were posters and tote bags. Posters and tote bags contain health impression messages, namely an invitation to be vigilant to recognize the symptoms of DHF and the movement to cover, drain, utilize, and avoid mosquito bites as an effort to control DHF.

This session not only increased active participation in the discussion but also created a more vibrant and positive atmosphere through the distribution of door prizes. The community was very enthusiastic about getting this door prize. The door prizes were given by asking questions to the community and the people who could answer the questions were the ones who got the door prizes. Thus, this health promotion activity is not only a means of delivering information but also a place to build a community that supports each other and shares knowledge among the community, creating an inclusive environment and supporting joint health efforts.

Furthermore, a declaration of commitment with the community was carried out to increase community awareness in fighting dengue disease to realize a healthy family and create a clean environment. In this session, the community was very active and excited when declaring a joint commitment to fighting dengue with 3M +. In addition to declaring a joint commitment, the community also signed the commitment. After the whole series of activities took place, at the end of the activity the community was given a knowledge questionnaire about dengue prevention after being given health education (post-test). This post-test aims to evaluate the extent of knowledge improvement that has been obtained by the community after participating in health education.

By involving the community in this post-test, it can be measured whether the material presented was successfully received and well understood by the participants. The post-test results will provide a clearer picture of the effectiveness of health education activities. By comparing the results of the pre-test and post-test, the team can evaluate the overall change in community knowledge. Furthermore, this evaluation can serve as a basis for refining the extension approach in the future, ensuring that health messages can be maximally conveyed and have a positive impact on efforts to prevent Dengue Fever (DHF) in the community.



Education is a measure of the success and quality of human resources. The high level of education in a region indicates that the quality of human resources is higher or superior and vice versa, the low level of education in a region indicates a decrease in the quality of human resources (9). The characteristics of respondents based on the level of education describe and provide information about the level of formal education that has been completed by the community in Pulerejo hamlet. A person's education can be assumed to correlate with the level of knowledge because generally someone with higher education is expected to have good abilities (10). Most respondents have a high school education (53.3%), which shows that there is a significant relationship between education and action. The higher the level of education, the greater the role in the prevention of dengue infection (15).

Health promotion through health education with lecture and discussion methods was proven to improve the knowledge of respondents (11) about dengue prevention and control. The health promotion was supported by health promotion media in the form of posters and tote bags containing health messages on how to recognize DBB and its control efforts. This is in line with Anisa's research (2023) which states that there is a significant difference in the average knowledge of dengue hemorrhagic fever prevention before and after being given health education (12). This increase can illustrate the effectiveness of health education in conveying information about the prevention of Dengue Hemorrhagic Fever (DHF) to the community. This reflects that health education activities have a positive impact on increasing community knowledge related to dengue fever prevention. Counseling on dengue fever has an impact on increasing knowledge related to preventing dengue transmission in the school environment (13). Knowledge can be referred to as a consequence of an individual's understanding of something, which is obtained through the utilization of sensory abilities, such as sight, smell, hearing, and so on (3)(14). One of the efforts to prevent DHF in the community is through health education activities. By providing health information, education can increase people's knowledge about dengue prevention, give them a better understanding, and encourage lifestyle changes to avoid this disease (12).

According to the results of research conducted by Lindawati in Dlingo Village, Mojosongo, Boyolali stated that health counseling on efforts to increase public knowledge in the context of preventing and overcoming DHF is effective in increasing public knowledge about efforts to prevent DHF (13). Likewise, research by I Gede Willy Karya Mahardika et al (2023) stated that there was a significant positive relationship between maternal knowledge and DHF prevention behavior in school-age children in Tegallingsah Village, Karangasem Bali (15).

This is following the Precede-Proceed Theory. The Precede-Proceed Theory is a framework used in the planning and evaluation of public health programs. This theory was developed by Lawrence Green in 1974(11,16). This theory identifies that individual knowledge plays an important role in shaping health behavior. According to this theory, the first stage called Precede (Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation) emphasizes factors that influence individual motivation and knowledge before health actions occur (17). In the context of Dengue Fever (DHF) prevention, the preceding stage will include an evaluation of community knowledge about DHF prevention efforts through a pre-test, which then forms the basis for designing an appropriate extension program.

By building strong knowledge, a person is able to make better decisions regarding their health, including in DHF prevention efforts. Therefore, DHF prevention approaches prioritize knowledge improvement as a strategic first step, ensuring that people have sufficient information to make sustainable decisions and promote healthy lifestyles for long-term well-being (18). Health promotion not only provides information and increases people's knowledge about health but seeks to facilitate behavior change and environmental changes that affect health (19) Regarding dengue prevention, although the participants scored high in some indicators, the overall prevention practices were unsatisfactory. This suggests that there is an urgent need to expand educational outreach aimed at raising public awareness about dengue and encouraging preventive practices in rural communities as was done in Bangladesh (20).

Lack of information hinders symptom identification and poor implementation of effective measures, and the development of standardized education strategies can contribute to efficient and cost-effective

disease control (21). These findings are in line with previous studies that recommend continuous and urgent education and training programs to increase the level of KAP and improve the capacity and capability of DF prevention and control. This is particularly important for the first point of care of DF patients (22).

The implementation of health education activities in the community expressed that the content of the material presented provided useful information and was relevant to the needs in dealing with health problems. In addition, there was also a positive response indicated by the enthusiasm of the community during the delivery of information and in providing education considered appropriate and effective. The implementation time is considered sufficient to give the impression that this program is well-planned and pays attention to the needs of the community. The results of this activity show that increased knowledge is a strong basis for considering the improvement and sustainability of health education programs. The urgency of health promotion methods aims to determine the changes in behavior that want to be achieved, namely at the level of knowledge. In achieving the objectives of health promotion activities using health promotion methods tailored to the target group (23).

The media used used totebags containing prevention material against DHF and posters that were installed in public places, namely the Community Association (RW) Hall which was used for community activities. Under the characteristics of outdoor advertising mass media methods, namely broad targets to increase knowledge (24). This is in line with previous studies that emphasize the need for decisive action from authorities to address the impact of the dengue epidemic, the importance of community engagement through partnerships and participatory approaches, the potential benefits of incentives and rewards to increase community participation, and the need for ongoing community engagement and education, especially through involving young people in prevention efforts. These findings provide valuable insights in designing effective strategies to fight Aedes mosquitoes and dengue fever (25).

## 5. Conclusion

Health promotion with health education approach and lecture and discussion methods can improve community knowledge about dengue prevention and control. The joint declaration is a form of community commitment to do “3M plus” as part of health promotion to control dengue prevention and control. Health promotion needs to be carried out in all Community-Sourced Health Efforts more massively to reach all levels of society so that efforts to prevent DHF are more optimal.

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## REFERENCES

1. A. SUTRIYAWAN, “Pencegahan Demam Berdarah Dengue (Dbd) Melalui Pemberantasan Sarang Nyamuk,” *J. Nurs. Public Heal.*, vol. 9, no. 2, pp. 1–10, 2021, doi: 10.37676/jnph.v9i2.1788.
2. Nyarmiati, “Analisis Spasial Faktor Risiko Lingkungan Pada Kejadian Demam Berdarah Dengue,” *J. Higea J. Public Heal. Res. Dev.*, vol. 2, no. 4, p. hal.1-11, 2017.
3. R. K. Sari, I. Djamaluddin, Q. Djam'an, and T. Sembodo, “Pemberdayaan Masyarakat dalam Upaya Pencegahan Demam Berdarah Dengue DBD di Puskesmas Karangdoro,” *J. ABDIMAS-KU J. Pengabd. Masy. Kedokt.*, vol. 1, no. 1, p. 25, 2022, doi: 10.30659/abdimasku.1.1.25-33.
4. WHO, “World Health Organization,” 2020.
5. Kementerian Kesehatan RI, *Profil Kesehatan Indonesia 2023*. Kementerian Kesehatan Republik Indonesia, 2023.
6. Dinkes Sleman, “Profil Kesehatan Kabupaten Sleman Tahun 2020,” 2020.
7. Sugiyono, *Metode Penelitian Kuantitatif*. Bandung: Alfabeta, 2018.



8. S. Dahlan, *Statistik Untuk Kedokteran dan Kesehatan*. Jakarta: Salemba Medika, 2013.
9. D. Desmawan et al., “Analisis Peran Pendidikan Terhadap Kualitas Sumber Daya Manusia Guna Meningkatkan Produktivitas Masyarakat Di DKI Jakarta,” *J. Ilmu Manajemen, Ekon. dan Kewirausahaan*, vol. 1, no. 2, pp. 214–224, 2023.
10. A. A. S. A. S. Putra et al., “Analisis Hubungan Antara Tingkat Pendidikan Dan Perilaku Berisiko Dengan Angka Kejadian Demam Berdarah Dengue (DBD) Di Desa Mayangrejo,” *Care J. Ilm. Ilmu Kesehat.*, vol. 11, no. 2, pp. 277–284, 2023, doi: 10.33366/jc.v11i2.4005.
11. H. Trisnowati, *Perencanaan Program Promosi Kesehatan*, 1st ed. Yogyakarta: Penerbit Andi, 2018.
12. I. G. W. K. Mahardika, M. Rismawan, and I. N. Adiana, “Hubungan Pengetahuan Ibu Dengan Perilaku Pencegahan Dbd Pada Anak Usia Sekolah Di Desa Tegallingsah,” *J. Ris. Kesehat. Nas.*, vol. 7, no. 1, pp. 51–57, 2023, doi: 10.37294/jrkn.v7i1.473.
13. N. Y. Lindawati, L. Murtisiwi, T. A. Rahman, P. N. Damayanti, and F. M. Widyasari, “Upaya Peningkatan Pengetahuan Masyarakat Dalam Rangka Pencegahan Dan Penanggulangan Dbd Di Desa Dlingo, Mojosongo, Boyolali,” *SELAPARANG J. Pengabd. Masy. Berkemajuan*, vol. 4, no. 2, p. 473, 2021, doi: 10.31764/jpmb.v4i2.4305.
14. S. Notoatmodjo, *Promosi Kesehatan dan Perilaku Kesehatan*. Rineka Cipta, 2012.
15. E. Irawaty, W. A. Chen, and G. Miracle, “Pencegahan Penyakit Demam Berdarah,” pp. 661–668, 2021.
16. J. Kim, J. Jang, B. Kim, and K. H. Lee, “Effect of the PRECEDE-PROCEED model on health programs: a systematic review and meta-analysis,” *Syst. Rev.*, vol. 11, no. 1, pp. 1–12, 2022, doi: 10.1186/s13643-022-02092-2.
17. W. C. Rachmawati, *Promosi Kesehatan Dan Perilaku Kesehatan*. Malang: Wineka Media, 2019.
18. I. Nurmala, F. Rahman, A. Nugroho, N. Erlyan, N. Laily, and V. A. Anhar, *Promosi Kesehaatan*. Surabaya: Airlangga Univercity Press, 2018.
19. H. Trisnowati, “Pemberdayaan Masyarakat untuk Pencegahan Faktor Risiko Penyakit Tidak Menular ( Studi pada Pedesaan di Yogyakarta ) Community Empowerment to Prevent Risk Factors of Non Communicable Diseases ( Case in A Rural Communities of Yogyakarta ),” *J. MKMI*, vol. 14, no. 1, pp. 17–25, 2018, [Online]. Available: <https://media.neliti.com/media/publications/238453-pemberdayaan-masyarakat-untuk-pencegahan-66673211.pdf>.
20. R. Banik et al., “Public knowledge, belief, and preventive practices regarding dengue: Findings from a community-based survey in rural Bangladesh,” *PLoS Negl. Trop. Dis.*, vol. 17, no. 12, pp. 1–24, 2023, doi: 10.1371/journal.pntd.0011778.
21. Y. J. L. Pérez, A. L. Rodríguez-Acelas, R. Mattiello, and W. Cañon-Montañez, “Effectiveness of a Nursing Educational Intervention in Adults to Promote Control Behaviors Against Dengue: Protocol for a Randomized Controlled Trial,” *JMIR Res. Protoc.*, vol. 13, no. 1, pp. 1–10, 2024, doi: 10.2196/54286.
22. M. Abbasi et al., “Uncovering the knowledge gap: A web-based survey of healthcare providers’ understanding and management of dengue fever in East Azerbaijan, Iran,” *PLoS One*, vol. 19, no. 6, pp. 1–16, 2024, doi: 10.1371/journal.pone.0305528.
23. S. Mastuti, L. Ulfa, and S. Nugraha, “Jurnal Ilmu Kesehatan Masyarakat JURNAL ILMU KESEHATAN MASYARAKAT,” *J. Ilmu Kesehat.*, vol. 14, no. 01, pp. 93–112, 2019.
24. C. I. Fertman and D. D. Allensworth, *Health Promotion Programs: From Theory to Practice*. San Francisco, CA: Jossey-Bass, 2010.
25. N. A. Samsudin, H. Othman, C. S. Siau, and Z. ‘Izzat I. Zaini, “Exploring community needs in combating aedes mosquitoes and dengue fever: a study with urban community in the recurrent hotspot area,” *BMC Public Health*, vol. 24, no. 1, pp. 1–13, 2024, doi: 10.1186/s12889-024-18965-1.