



Effectiveness of Health Promotion Strategies on Dengue Hemorrhagic Fever Prevention and Control: A Literature Review

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Abstract

Background: Dengue Hemorrhagic Fever (DHF) is a mosquito-borne infectious disease whose prevention and control depend largely on effective health promotion to influence community behavior. **Objective:** This study aims to review the effectiveness of health promotion strategies in improving public literacy for DHF prevention and control. **Methods:** A literature review was conducted by analyzing five relevant articles published between 2020–2024 from Google Scholar, PubMed, Research Gate, and GARUDA databases. The selected articles were descriptively analyzed to evaluate the implementation and outcomes of health promotion strategies. **Results:** The review shows that health promotion strategies integrating advocacy, social support, and community empowerment are effective in reducing the incidence of DHF when implemented through coordinated cross-sector collaboration. Active community participation strengthens behavioral change and program sustainability. Nevertheless, several barriers persist, including limited political commitment, inadequate monitoring systems, and insufficient resources, which reduce the effectiveness of these strategies. The findings emphasize that health promotion must be adaptive, participatory, and supported by clear policy frameworks to maximize impact. **Conclusion:** Strengthening collaboration across sectors, ensuring adequate resources, and tailoring health promotion to local community needs are essential to achieving sustainable and effective dengue prevention and control in Indonesia.

Keywords: Health Promotion Strategy; Prevention and control; DHF.

Introduction

Dengue hemorrhagic fever (DHF) is an infectious disease caused by the dengue virus and transmitted through the bite of *Aedes* sp. mosquitoes^{1,2,3}. These mosquitoes, characterized by their black and white markings, are the cause of DHF transmission⁴. This disease is common in tropical and subtropical climates, including Indonesia, and poses a serious public health problem⁵. In Indonesia, DHF is often referred to as dengue virus infection, with primary symptoms including sudden high fever for 2-7 days, headache, eye pain, joint and muscle pain, and skin rash. In some cases, DHF can progress to

the more severe dengue hemorrhagic fever (DHF) or dengue shock syndrome (DSS), which can be life-threatening if not treated promptly and appropriately. Indonesia experienced its first Extraordinary Event (KLB) in 1968 in Jakarta and Surabaya, with 58 cases and 24 deaths (Case Fatality Rate/CFR of 41.3%), leading the government to focus on DHF management since then⁶.

Efforts to control the mosquito vector of DHF are necessary⁷. This control can be done in various ways, including fogging, mosquito nest eradication (PSN), larvicides, using bed nets, the 3M approach (draining, covering, and burying used items), and more recently, the government has initiated the G1R1J (One

House, One Jumentik Movement)^{8,9}. These steps are intended to accelerate mosquito control to reduce the number of DHF cases⁸.

Health promotion is a step that can be taken for DHF control¹⁰. According to Green and Kreuter (1991), health promotion is a combination of educational and environmental efforts to foster actions and conditions for healthy living¹¹. Education, advocacy, and collaboration are parts of health promotion that can be used for DHF control¹². Health promotion is carried out with the hope of encouraging the community to actively participate in controlling the DHF vector, such as through mosquito nest eradication and increasing compliance with DHF prevention protocols¹³. Empowerment is also a form of health promotion that directly involves the community^{14,12}. In this context, community empowerment is greatly influenced by the perception of the relationship between humans and their living environment and their health experiences; thus, the better the community's understanding of the importance of health, the more effectively empowerment can be implemented⁷. All aspects of health promotion, if implemented well, will yield maximum results in improving health status¹⁵.

Currently, literature on health promotion strategies for DHF prevention and control is still limited, even though DHF cases continue to rise, especially during the rainy season. Therefore, it is necessary to conduct research to provide insights into health promotion strategies for DHF prevention and control. Consequently, this research aims to answer the question: "How effective are health promotion strategies in improving community literacy on the prevention and control of DHF?" While previous reviews, such as the one by Riyadi, have explored the effectiveness of health promotion, this review specifically focuses on the most recent five-year period (2020-2024) to provide an updated synthesis of strategies and

their implementation challenges in the Indonesian context.

Materials and Methods

Research Design

This study employed a literature review design, where the authors identified and analyzed several prior studies with similar themes. The article search was conducted online on January 5, 2024, through Google Scholar, PubMed, ResearchGate, and GARUDA. In the search process, the researchers used the combination of keywords and Boolean operators, such as ("health promotion strategy" OR "health education") AND ("dengue prevention" OR "DHF control") AND Indonesia. Medical Subject Headings (MeSH) terms were also considered where applicable. The articles were limited to the last five years to ensure the data remained relevant and current¹⁶.

Sample

The sample in this study consisted of scientific articles that met the established inclusion and exclusion criteria. Inclusion criteria included studies discussing health promotion strategies in DHF prevention and control and articles accessible in full text. Exclusion criteria included articles irrelevant to the research theme, articles with similar themes but not accessible in full text, and studies that were not about health promotion strategies in DHF management^{17,18,19}.

Data Collection Technique

Data collection was performed using a systematic search and screening method with a PRISMA diagram. Articles found in the initial search through various platforms were filtered by identifying thematic relevance and full-text accessibility. Articles meeting the inclusion criteria were then summarized to facilitate the literature review analysis process. A total of

five articles met the inclusion criteria and served as the sample for this study²⁰.

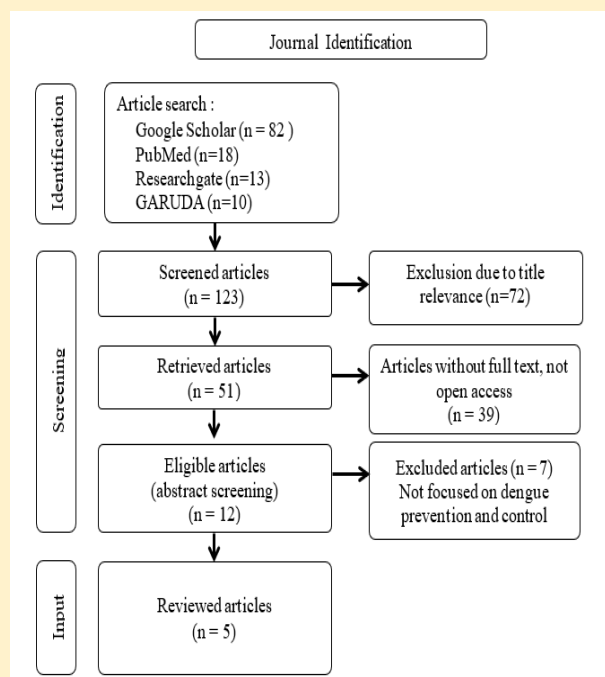


Figure 1. PRISMA Flow Diagram of Literature Selection

The study selection process is illustrated in the PRISMA flow diagram (Figure 1). The initial search across all databases yielded 450 articles. After removing 120 duplicates, 330 articles were screened based on title and abstract. Of these, 300 were excluded for not meeting the inclusion criteria. The remaining 30 full-text articles were assessed for eligibility, and 25 were excluded for reasons such as not focusing on health promotion strategies or being conducted outside the specified timeframe. Finally, five articles met all inclusion criteria and were included in the qualitative synthesis.

Data Analysis Technique

The data analysis used was descriptive analysis. Data from the five summarized articles were analyzed in-depth to understand the health promotion strategies in DHF prevention and control. Each article was discussed separately,

with analysis conducted carefully to ensure all relevant and important information was identified¹⁶.

A quality assessment of the included studies was performed using a standardized checklist adapted from the Mixed Methods Appraisal Tool (MMAT). This tool was used to evaluate the methodological quality of qualitative, quantitative, and mixed-methods studies based on criteria such as appropriate study design, clear sampling strategy, and suitable data analysis. All five included studies met the basic quality criteria for inclusion in this review

Ethical Considerance

Ethical Clearance was not required for this study as the research only used secondary data in the form of previously published and openly accessible articles. Nevertheless, research ethics principles were upheld, including respect for intellectual property rights by providing proper citations for each source used..

Result

The literature review conducted on several articles greatly helped the researchers understand health promotion strategies in DHF management. Some of these articles had similarities and differences, but essentially, all health promotion activities conducted were for the prevention and control of DHF.

The selected articles were then analyzed by the authors for their strengths and weaknesses. Health promotion is a step to change community behavior to be more concerned with DHF prevention and control efforts²¹. The insights gained from these studies serve as valuable references for developing more effective, evidence-based health promotion models that can be adapted to various community settings to enhance DHF prevention and control outcomes.

Tabel 1. Article Search Results

No	Title	Researchers	Year	Method	Sample	Results
1	Health Promotion Strategies for Dengue Hemorrhagic Fever (DHF) Prevention in the Working Area of Antang Community Health Center, Makassar City	Suhaela, Muhammad Hasan	2021	Qualitative Study	Sample selection was done using purposive sampling, with a total of 13 informants. Primary data was collected through internet searches (in-depth interviews) with the informants.	Advocacy has been carried out; however, there is no political support in the form of regulations or laws. Social support is also minimal. In terms of community empowerment, healthcare workers frequently provide education about DHF at integrated health service posts (Posyandu) during the rainy season. However, communication barriers hinder residents from effectively receiving health messages.
2	Strategies of Cigeureung Community Health Center in Combating Dengue Hemorrhagic Fever (DHF) in Sukamanah Subdistrict, Cipedes District, Tasikmalaya City	Mardiansyah Solli Prtama, Endah Vestikowati, Kiki Endah	2021	Descriptive Qualitative Study	5 informants	The strategies of the Cigeureung Community Health Center in combating DHF have not been optimal, as many community members remain indifferent to the implementation of Mosquito Nest Eradication (PSN), and the number of field monitoring personnel is limited.
3	Strategies for Dengue Hemorrhagic Fever (DHF) Prevention and Control (Case in North Kuta District, Badung Regency)	Made Agus Sugianto	2023	Quantitative Observational Study with a Cross-Sectional Design	10 community health center staff, 2 Health Office employees, 3 lecturers from the Public Health Study Program at Dhyana Pura University, Bali.	The main priorities in DHF prevention and control strategies are to enhance health promotion and education broadly to the community, involve all community components, and support these efforts with increased budgets, training for managers, and the development of a disease surveillance information system application.
4	Health Promotion Strategies for Combating Dengue Hemorrhagic Fever (DHF) at the Health Office of Wajo Regency	Dian Anwar, Rama Nur Kurniawan K, Aswadi	2021	Qualitative Study with a Phenomenological Approach	Health Office staff, Community Health Center staff	The Health Office of Wajo Regency has conducted advocacy for combating DHF, supported by social partnerships involving the Health Office, local government, Education Office, and regional

No	Title	Researchers	Year	Method	Sample	Results
5	Overview of 3M Plus Health Promotion Efforts in Dengue Fever Prevention in Karet Kuningan Subdistrict, South Jakarta, 2023	Sekar Retno Pradini, Izza Suraya, Elia Nur A'yunin	2023	Mixed-Method Approach	102 respondents	coordinators in mosquito nest eradication (PSN). Community empowerment has been carried out through larva monitoring/jumantik training for community volunteers and residents, as well as communal cleanup efforts to eliminate mosquito breeding sites. The G1R1J program (One House, One Jumantik Movement) has been implemented. Univariate results show that community knowledge reached 92.2%, attitudes 52%, and behaviors 56.9%, which are still suboptimal. Therefore, health promotion activities need to be intensified to increase community awareness and active participation in dengue fever prevention efforts.

A thematic analysis of the five reviewed studies identified three dominant themes consistent with the WHO's health promotion framework: advocacy, social support, and empowerment. Community empowerment emerged as a central approach, exemplified by initiatives such as the "One House, One Jumantik" (G1R1J) program that actively involves residents in dengue surveillance and prevention. Advocacy efforts were evident but often constrained by insufficient policy support and stakeholder engagement. Social support, through collaborative partnerships and community-based activities, played a crucial role in sustaining behavioral change. Nonetheless, persistent challenges such as inadequate communication channels and a shortage of monitoring personnel limited the overall effectiveness and continuity of these health promotion strategies.

Discussion

DHF disease is caused by the *Aedes* sp. mosquito. Weather factors influence the breeding of these mosquitoes²². Controlling their breeding can be done through Mosquito Nest Eradication (PSN). PSN implementation usually works in conjunction with health promotion programs⁸. According to WHO, health promotion strategies can be conducted through three main approaches: advocacy, social support, and empowerment²³. Advocacy is an effort to influence policy, typically involving cross-sector collaboration²⁴. Social support is an effort to gain support for activities aimed at DHF prevention and control. Social support activities can include the 3M Plus PSN program²⁵. Empowerment is a step to involve the community in actively participating in DHF prevention and control activities¹². In

implementing health promotion strategies, media can be used to facilitate education²⁶.

The Health Promotion Strategy at Antang Community Health Center focuses on empowerment and the role of health workers. Advocacy, social support, and empowerment have been implemented. During the rainy season, health workers provide DHF counseling. Counseling is an activity that can improve community or respondent knowledge²⁷. Essentially, Antang Community Health Center has implemented various health promotion strategies for DHF control, but their implementation is considered less than optimal²⁸. This article explains the activities that have been carried out in the working area of Antang Community Health Center, but it does not explain the budget allocated for health promotion, specifically for DHF prevention. The strength of this article is its clear discussion of the roles of advocacy, social support, and empowerment, allowing for an evaluation of what shortcomings need to be addressed in these activities. The communication barriers in Antang may stem from a top-down approach to education that does not consider local cultural contexts or literacy levels, rendering health messages ineffective.

Clean and healthy living behavior in DHF prevention and control can be achieved through the 3M Plus activities¹⁰. Behavior has been shown to influence DHF cases [29]. This was also done by the Cigeureung Community Health Center in DHF management in Sukamanah Village, Cipedes District, Tasikmalaya City, which has implemented PSN but still lacks field monitoring personnel. Based on these results, a movement is expected to more vigorously implement the strategies that have been made, so that the strategies are not merely discourse but are truly implemented, allowing for more optimal DHF control³⁰. This article comprehensively explains the strategies implemented in DHF management but does not

explain the health promotion theory or concept used, so readers cannot know whether the strategies implemented are in line with the theory. The strength of this article is that it presents all activities that have been done or planned, but its weakness is the lack of in-depth discussion of each sub-theme, so readers only get limited information on these sub-themes. The insufficient monitoring personnel in Cigeureung² points to a critical resource allocation gap, where strategic plans are not supported by adequate funding or human resources, leading to poor implementation.

The DHF prevention and control strategies implemented in North Kuta District, Badung Regency, are an effort to suppress DHF cases, which predominantly affect adults because high population mobility influences the occurrence of DHF cases³¹. From this article, information was obtained that the priority focus of DHF prevention and control strategies is to enhance promotion and education to the community, hoping that the community will have good knowledge of DHF prevention and control³². The strength of this study is the explanation of case distribution, allowing readers to understand the picture of the cases that occurred, but its weakness is the lack of discussion on the analysis performed, as it is only discussed generally. The strength of the article is that the case distribution is accompanied by pictures and graphs for clarity, but its weakness is that it does not explain the theory or concept used, so readers do not know the concept used in this article.

The health promotion strategy for DHF management efforts at the Wajo Regency Health Office was conducted to determine the health promotion strategies that have been implemented by the Wajo Regency Health Office. Based on this research, it is known that the Wajo Regency Health Office has implemented advocacy, social support, and empowerment in accordance with WHO's

health promotion strategies, but there are still shortcomings³². The strength of this research is that the discussion refers to the concept of health promotion according to WHO, namely that health promotion strategies include advocacy, social support, and empowerment, allowing for a more detailed discussion. The weakness of this research is that no recommendations were made based on the research results; only suggestions were written in the conclusion. The strength of this article is its detailed explanation, making it easier for readers to understand, while its weakness is that it does not discuss the use of the open code application used in the analysis.

The overview of 3M plus health promotion efforts in the community for DHF prevention in Karet Kuningan Subdistrict, South Jakarta, in 2023, shows that health promotion efforts were carried out through empowerment in the form of the One House One Jumantik (G1R1J) movement program, which can be used as an effort to prevent DHF transmission³³. Meanwhile, the univariate results showed high knowledge at 92.2%, attitude at 52%, and poor behavior at 56.9%. The suggestion from this research is to implement better health promotion efforts to improve community awareness of DHF prevention³⁴. The strength of this research is its discussion of health promotion strategies based on WHO, making it easier for readers to understand the research results because the discussion is based on the concept, while its weakness is that the respondents in the qualitative and quantitative methods were different, which is feared to cause differences in delivery from the respondents. This article certainly has the advantage of explaining the research stages in detail, but it has the weakness of not writing in detail about the quantitative analysis conducted.

Based on the articles discussed above, it is evident that DHF prevention and control efforts

have been carried out through WHO's health promotion strategies, but there are still shortcomings in their implementation, making the results less than optimal. This literature review can serve as a reference for implementing health promotion strategies for DHF prevention and control, but it is still considered insufficient due to the limited number of articles discussed, so other references still need to be added.

Limitations

This literature review has several limitations. The search was restricted to articles published in English and Indonesian, potentially excluding relevant studies in other languages. The reliance on published literature may introduce publication bias, as studies with significant findings are more likely to be published. Furthermore, the small number of included articles (n=5) limits the generalizability of the findings.

Conclusion

This literature review enhances community understanding of health promotion strategies for dengue hemorrhagic fever (DHF) prevention and management. Evidence from recent studies (2020–2024) confirms that strategies emphasizing advocacy, social support, and community empowerment are effective in reducing DHF incidence, particularly when supported by strong cross-sector collaboration and sufficient resources. However, persistent challenges such as limited political commitment, inadequate monitoring, and resource constraints continue to hinder program effectiveness. Therefore, future research should include systematic reviews, meta-analyses, and qualitative studies to comprehensively evaluate effectiveness, identify barriers, and strengthen community-based approaches tailored to local socio-

cultural contexts for sustainable dengue control in Indonesia.

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Conflict of Interest Statement

The author(s) declare no commercial, financial, or personal conflicts of interest related to this research. All authors approved the final manuscript and consented to its publication in *Healthy Tadulako Journal*.

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