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Transforming Dengue Prevention: Community Knowledge and Health Promotion as Keys to Reducing Mortality in Surakarta, Central Java, Indonesia

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ABSTRACT

Background: Dengue Haemorrhagic Fever (DHF) remains a major public health threat in tropical regions like Surakarta, Indonesia. While conventional mosquito control methods such as fogging are widely implemented, their long-term effectiveness is limited. This study investigates how gaps in community knowledge regarding dengue symptoms and warning signs contribute to treatment delays and increased mortality rates.
Subjects and Method: The study employed a quantitative-method approach focusing on the year 2024. Due to fieldwork challenges, a total sampling of 11 families who lost members to DHF was conducted using proxies, including relatives, neighborhood heads, and health cadres. Data were collected through semi-structured interviews and analyzed using SPSS for descriptive and inferential statistics, including multiple linear regression and ANOVA analysis.
Results: DHF fatalities in Surakarta rose by over 150%, from 4 deaths in 2023 to 11 in 2024, with the 5–14 age group being most vulnerable. Statistical analysis revealed that all 11 families lacked sufficient knowledge of dengue symptoms. While most variables were not statistically significant, family recognition of experienced symptoms was a critical factor in identifying the disease. The high R-square value (91.4%) indicates that knowledge gaps and information access strongly influence DHF awareness.
Conclusion: The primary driver of DHF mortality in Surakarta is a critical lack of knowledge among families, leading to fatal delays in seeking medical care. Traditional reactive strategies like fogging are insufficient. Reducing mortality requires a paradigm shift toward inclusive, knowledge-based community empowerment and early warning health education.

Keywords: dengue, empowerment, knowledge-based mitigation, mortality

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BACKGROUND

This article confirms that the transition in the management of Dengue Haemorrhagic Fever (DHF) from conventional approaches focused on mosquito breeding site eradication through spraying (fogging) to investing in community knowledge represents a necessary strategic step (Permatasari and Kesetyaningsih, 2022; Samsudin, Othman, *et al.*, 2024; Ashari et al., 2025; Juhairiyah *et al.*, 2025). DHF, caused by the dengue virus and transmitted by the aedes aegypti mosquito, has become a significant public health issue in many tropical countries, including Indonesia (Asish *et al.*, 2023; Deng *et al.*, 2024; Reza *et al.*, 2024; Jamal *et al.*, 2025). In this context, it is essential to understand that managing DHF relies not only on physical interventions but also on enhancing community knowledge and awareness.

DHF is characterized by symptoms such as high fever, bleeding, and can lead to death if not properly managed (Tantawichien, 2012; Riaz *et al.*, 2024; World Health Organization, 2025). In Indonesia, cases of DHF often surge, particularly during the rainy season when mosquito populations increase (Loasana, 2024). Although efforts to eradicate mosquito breeding sites through fogging have been widely implemented, their effectiveness is frequently questioned (Usuga *et al.*, 2019a; da Silva and Scalize, 2023). Numerous studies indicate that while fogging may reduce mosquito numbers in the short term, it is not always effective in preventing long-term outbreaks of DHF. This ineffectiveness stems from the fact that Aedes aegypti mosquitoes can breed in various locations, including unclean household environments (da Silva and Scalize, 2023; Seid, Aklilu and Animut, 2024) .

Conventional Approaches have its limitations. Conventional methods such as fogging are often reactive and do not address the root causes of the problem(Bowman, Donegan and McCall, 2016; Usuga et al., 2019b; Selvarajoo et al., 2020; Juhairiyah et al., 2025). Communities tend to rely on government actions for fogging without understanding the importance of maintaining environmental cleanliness and reducing mosquito breeding sites (Samsudin et al., 2024). Furthermore, there is a prevalent belief that DHF only occurs in slum areas or after an outbreak has happened, leading to a neglect of preventive measures. Therefore, a paradigm shift in the management of DHF is required.

Investing in community knowledge about dengue hemorrhagic fever (DHF) is essential for increasing public awareness and improving responses to the disease (Belo et al., 2024). Effective health education programs can enhance community understanding of DHF symptoms, transmission, prevention strategies, and the role of larval monitoring agents. Improving knowledge of early warning signs, such as sudden high fever, muscle pain, and bleeding manifestations, enables individuals to seek medical attention promptly, thereby reducing the risk of severe complications. Furthermore, understanding the importance of timely healthcare-seeking behavior is critical, as rapid responses to suspected DHF cases can be lifesaving.

Community participation in vector control is also an important component of DHF prevention. Training family members to serve as larval monitoring agents within their households can help reduce mosquito populations through regular inspection and elimination of potential breeding sites (Lusno et al., 2024; Oktaviana, 2024). To achieve sustainable behavioral change, health education initiatives should be implemented in a structured and continuous manner (Ihunanya et al., 2024; Dapari et al.,

2025; Mohamed et al., 2025). Interactive and community-based educational approaches are particularly effective in strengthening public understanding of environmental sanitation, mosquito control measures, and other preventive practices, thereby contributing to the reduction of DHF transmission.

SUBJECTS AND METHOD

1. Study Design

This research utilizes a qualitative-methods approach to explore how a lack of knowledge influences treatment delays in dengue fever cases leading to fatalities. The design is structured to provide insights into personal experiences and knowledge gaps of affected families.

2. Population and Sample

The initial population consisted of families in Solo (Surakarta), Central Java, Indonesia, who lost a member to confirmed dengue fever between 2023 and 2024. The study employed a total sampling method. Due to field challenges such as traumatic refusals, the study utilized 11 families as the sample, incorporating proxies including relatives not living in the same household, neighborhood heads ("*Ketua RT*"), and local health cadres who possessed sufficient data regarding the victim's family conditions.

3. Study Variables

Independent variables were knowledge about DHF symptom and information access. The dependent variable was knowledge about the ability of families to recognize DHF symptoms.

4. Operational Definition of Variables

The study measures variables through dimensions and indicators using a Likert scale:

Symptoms: Broken down into sub-variables including symptom recognition, experienced symptoms, cause of hospitalization, and duration of hospitalization.

Information Access: Broken down into sub-variables including the cause of death, level of trust in hospital information, and access to prevention information from the government.

Knowledge: Defined as the family's ability to recognize the victim's dengue symptoms at the time of illness.

5. Study Instruments

Data collection was conducted using the following instruments:

Semi-structured Interview Guide: Developed based on existing literature and expert consultations, focusing on knowledge of symptoms, transmission, prevention, and experiences during the illness.

Likert Scale Questionnaire: Used to create instrument items for quantitative measurement of indicators.

Secondary Data Comparison: Information from neighbourhood authorities and health offices was used for triangulation.

6. Data Analysis

Quantitative Analysis: Descriptive statistics, including frequencies and percentages, were used to summarize participant characteristics and study variables. Multiple linear regression analysis was conducted to examine factors associated with knowledge of dengue hemorrhagic fever. All quantitative analyses were performed using SPSS software. Statistical significance was determined at a threshold of $p < 0.05$ (Creswell, 2009).

Qualitative Analysis: Interview transcripts were analyzed using thematic analysis to identify recurring patterns and themes related to knowledge gaps and delays in seeking treatment. The qualitative data were managed and analyzed using NVivo software.

7. Research Ethics

Ethical approval was obtained from the Health Office of the Local Government of

Surakarta prior to data collection. Informed consent was secured from all informants, ensuring they understood their rights, the confidentiality of their data, and the voluntary nature of their participation. The study also adjusted its population to use proxies based on considerations of research ethics regarding the traumatic experiences of victim families.

RESULTS

The number of deaths due to dengue haemorrhagic fever (DHF) increased from 2023 to 2024. In 2023, there were only 4 reported deaths, whereas in 2024, this number rose to 11. Compared to a population of nearly 600,000 individuals, these figures represent a small percentage. However, despite the low absolute numbers, an increase of over 150% serves as a significant alarm regarding the potential risks associated with DHF in the future. The number of DHF-affected individuals in 2024 was higher than that in 2023.

The table presents the distribution of dengue fever cases receiving medical care and deaths by age group and sex in Surakarta for 2023 and 2024. In terms of medical care cases in 2023, males accounted for a higher number (68 cases) compared to females (35 cases). The highest number of cases was observed in the 5–14 year age group, with 50 cases among males and 30 cases among females, indicating that this age group had the highest incidence of dengue fever.

Regarding mortality in 2023, the number of deaths was relatively low, with 1 case among males and 3 cases among females. All deaths occurred in the 5–14 year age group, suggesting that individuals in this group were more vulnerable to severe dengue outcomes.

In 2024, the number of deaths increased compared to 2023. Male deaths rose from 1 to 6 cases, while female deaths increased from 3 to 5 cases. Among males, the highest number of deaths was recorded in the 5–14 year age group (5 cases), followed by 1 case in the age group over 44 years. Among females, deaths in the 5–14 year age group remained the same (3 cases), while additional deaths were reported in the 15–44 year age group (2 cases).

Overall, although the total number of deaths remains relatively low, there is a noticeable increase from 2023 to 2024. The 5–14 year age group consistently shows the highest number of both medical care cases and deaths, indicating that this group is the ost affected by dengue fever in Surakarta, Indonesia.

Table 1. Number of death and medical cared based on sexes by age

Age Group	Medical care		Deaths (2023)		Deaths (2024)	
	Men	Female	Male	Female	Male	Female
< 1 year	0	0	0	0	0	0
1-4 year	4	4	0	0	0	0
5- 14 year	50	30	1	3	5	3
15 – 44 year	13	1	0	0	0	2
>44 year	1	0	0	0	1	0
Total	68	35	1	3	6	5

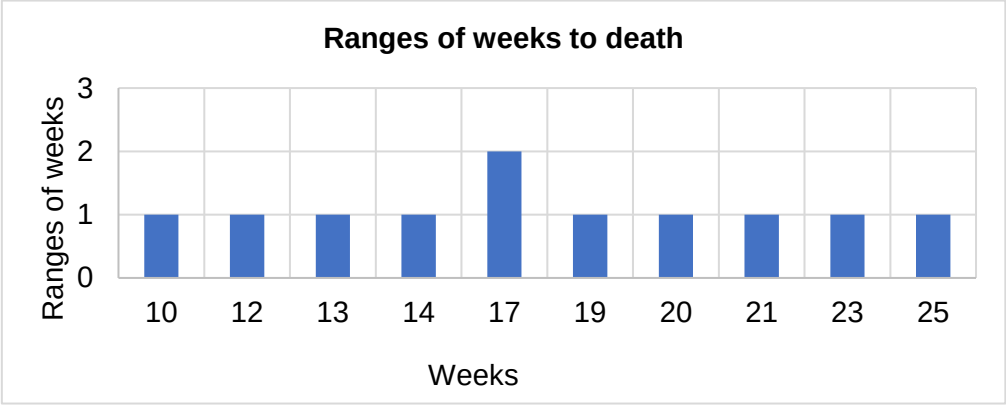

Figure 1. Diagram Ranges of weeks to death

Figure 1 records deaths due to dengue fever in the year 2024 based on time and the number of fatalities during specific weeks. An increase was observed from week 10 to week 25, with the highest peak occurring in week 17, which recorded 2 deaths. The total number of fatalities during this period was 11 individuals.

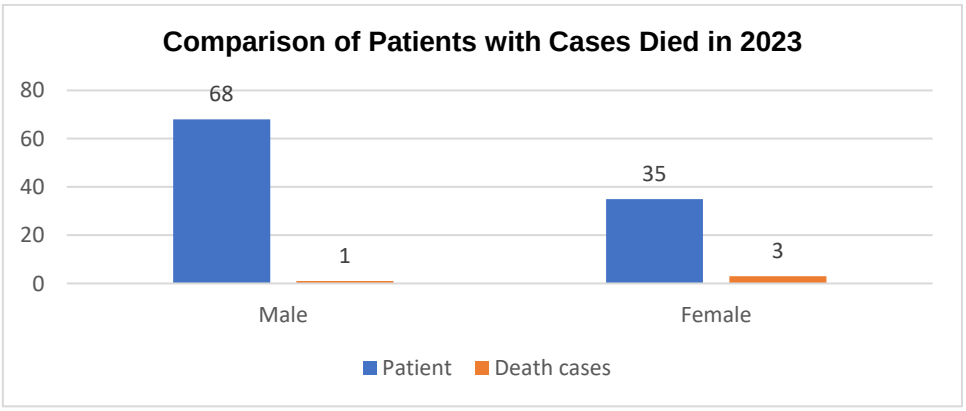

Figure 1. Diagram Comparison of Patients with Cases Died

The bar chart in Figure 2 illustrates the comparison between the number of dengue fever cases and the number of deaths in the year 2023. Among males, there were a total of 68 cases with 1 death. In contrast, among females, there were 35 cases with 3 deaths.

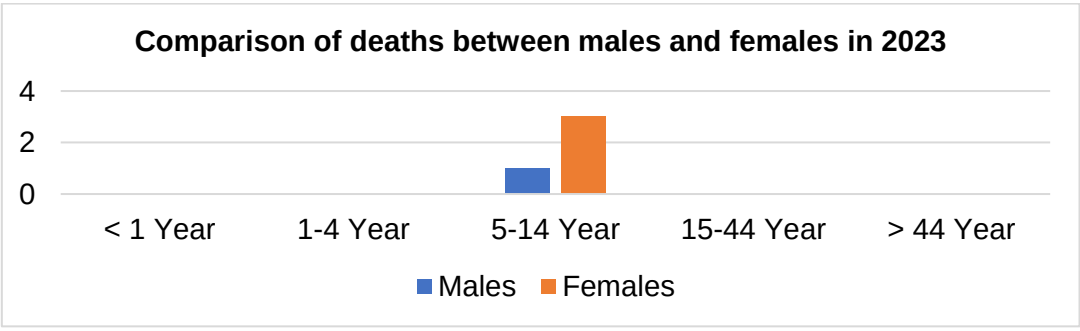

Figure 2. Diagram Comparison of deaths between males and females

Figure 3 depicts the comparison of male and female mortalities due to dengue fever in 2023. Specifically, among males, there was 1 fatality, while among females, there were 3 fatalities resulting from the disease.

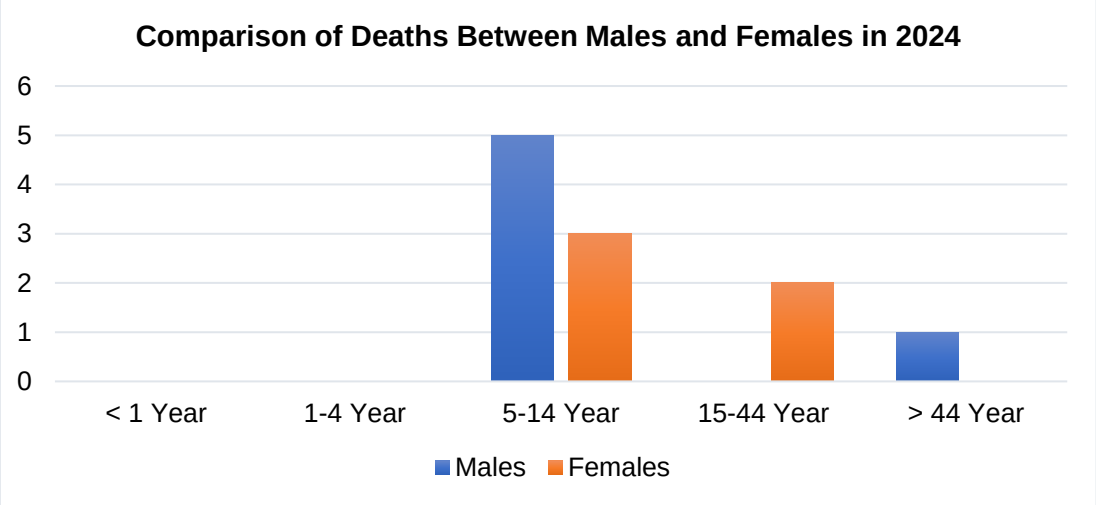

Figure 3. Diagram Comparison of deaths between males and females in 2024

The diagram above illustrates the comparison of male and female mortalities due to dengue fever in 2024. Specifically, among males, there were 6 fatalities, while among females, there were 5 fatalities resulting from the disease.

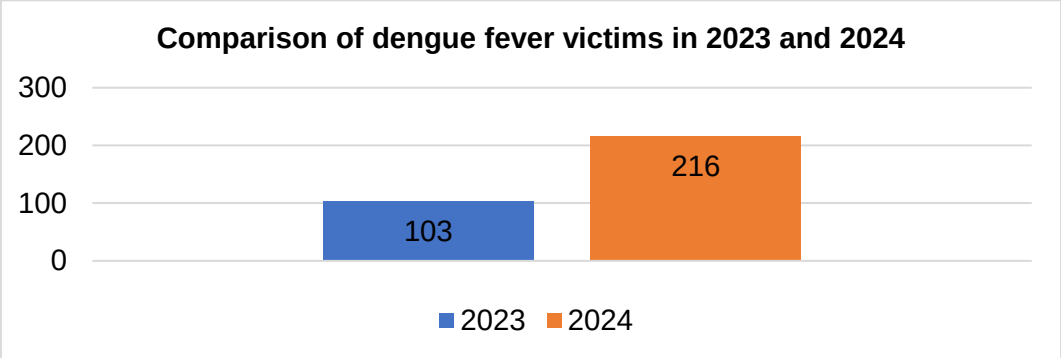

Figure 4. Comparison of dengue fever victims

Figure 5 illustrates the comparison of dengue fever cases between 2023 and 2024. In 2023, there were 103 cases; however, in 2024, there was a significant increase in dengue cases, reaching a total of 216.

Table 3. Multiple Linear Regression Analysis of the Association Between Symptoms, Information Access, and Knowledge of Dengue Hemorrhagic Fever

Variables	Unstandardized Coef. (b)	SE	Standardized Coef. (β)	p
Symptom				
Symptom recognition	-0.47	0.45	-0.33	0.365
Experienced symptoms	0.42	0.15	0.77	0.064
Cause of hospitalization	-0.13	0.24	-0.23	0.616
Duration of hospitalization	0.61	0.32	0.65	0.154
Information acces				
About cause of death	-0.48	0.32	-0.30	0.230
Level of trust in hospital information	0.43	0.47	0.34	0.434
Access to prevention information	-0.73	0.37	-0.51	0.144

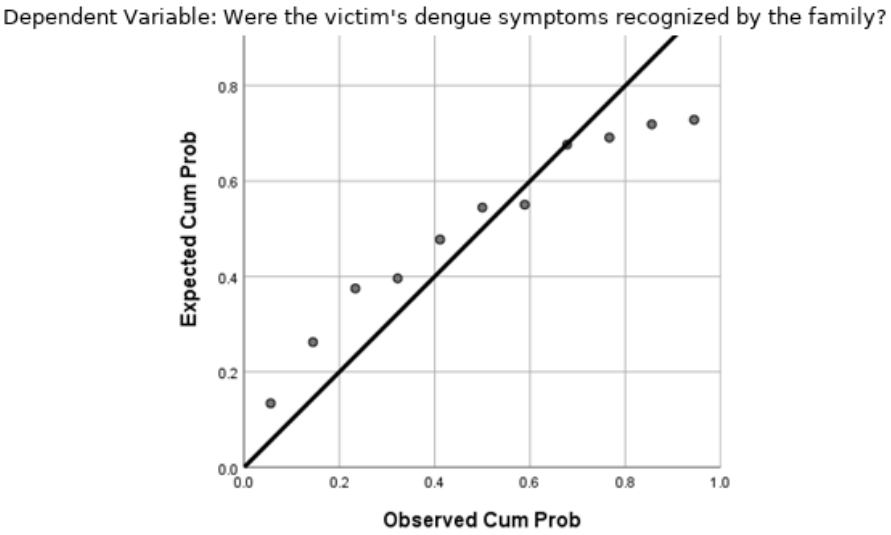

Figure 6. Normality Test P-Plot

Normal P–P Plot in the Figure 6, the data points are distributed closely around the diagonal line, indicating that the residuals follow a normal distribution. This finding confirms that the assumption of normality has been met, which is essential for ensuring the validity and reliability of the statistical analysis.

DISCUSSION

Beyond the statistical validation, the findings of this study highlight a critical shift in dengue control strategies. Traditionally, dengue prevention has relied heavily on reactive measures such as mosquito breeding site eradication and fogging. While these approaches remain important for short-term control, they are often insufficient to address the root causes of Dengue Hemorrhagic Fever (DHF). The results of this study support the growing body of evidence emphasizing the importance of transitioning toward more proactive and preventive strategies, particularly through investment in knowledge and community awareness (Sulistyawati et al., 2019; Aldila, 2023; Yulfi et al., 2025).

Increasing public knowledge about dengue especially regarding early symptoms, transmission patterns, and preventive behaviors plays a significant role in reducing both incidence and mortality rates. Communities that are well-informed are more likely to adopt preventive practices, such as eliminating standing water, maintaining environmental hygiene, and seeking early medical care. This aligns with previous studies indicating that behavioral change driven by health education can substantially reduce dengue transmission and severity (Jayawickreme et al., 2021; Dapari et al., 2025; Rossana, Katty and Mayra, 2025).

Furthermore, the study's findings on the distribution of cases and deaths particularly the higher vulnerability observed in the 5–14 year age group underscore the importance of targeted interventions. Children in this age group are often more exposed to mosquito bites due to outdoor activities and may have lower awareness of preventive measures. Therefore, school-based health education programs, combined with community engagement initiatives, could serve as effective strategies to reduce risk in this vulnerable population.

Another important implication of this study is the observed increase in mortality from 2023 to 2024. Although the absolute number of deaths remains relatively low, the upward trend signals a potential escalation in disease severity or gaps in early detection and treatment. This suggests the need to strengthen early warning systems, improve access to healthcare services, and enhance the capacity of local health facilities to manage dengue cases effectively.

In this context, investment in health education should not be viewed as a supplementary strategy but as a central pillar of dengue prevention. Compared to reactive measures, educational interventions offer more sustainable and long-term impacts by empowering individuals and communities to take preventive actions independently. Moreover, integrating digital platforms and community based communication channels can further enhance the reach and effectiveness of these interventions.

Finally, addressing DHF requires strong collaboration among multiple stakeholders, including government agencies, healthcare providers, educational institutions, and local communities. Local governments, in particular, play a crucial role in ensuring the continuity and effectiveness of dengue prevention programs. Periodic investments in integrated programs such as community health campaigns, school-based education, environmental management, and surveillance systems are essential to achieve sustainable outcomes (Suwantika et al., 2020; Llorente et al., 2023; Heyrani et al., 2024; Dapari et al., 2025).

The study concludes that the primary factor contributing to deaths from dengue hemorrhagic fever (DHF) in Surakarta in 2024 was a critical lack of knowledge among affected families regarding the symptoms and warning signs of dengue. All 11 families included in the study demonstrated insufficient awareness of early symptoms such as persistent fever, abdominal pain, vomiting, and signs of bleeding which led to delays in recognizing the severity of the illness. As a result, these delays directly contributed to late healthcare seeking behavior, significantly increasing the risk of mortality. This finding underscores the crucial role of early detection and timely medical intervention in preventing fatal outcomes in DHF cases.

The data further reveal a substantial increase in both dengue cases and fatalities from 2023 to 2024. The number of deaths rose by more than 150%, indicating a concerning upward trend in disease severity or gaps in prevention and response systems.

This increase was particularly evident among children aged 5–14 years, who consistently recorded the highest number of cases and deaths. This age group is likely more vulnerable due to higher exposure to mosquito bites during outdoor activities, combined with limited awareness and dependence on caregivers for recognizing symptoms and seeking treatment. Although males were more frequently infected, the rise in mortality affected both sexes, suggesting that the underlying issue is systemic rather than gender specific.

These findings highlight important limitations of conventional dengue control strategies, such as fogging and mosquito breeding site eradication. While these measures are effective in reducing mosquito populations in the short term, they do not adequately address behavioral and knowledge-related factors that influence disease outcomes. The persistence and increase of fatalities despite such interventions suggest that vector control alone is insufficient to reduce mortality. Instead, a more integrated approach is needed one that combines environmental control with community based health education and early warning systems.

A key implication of this study is the urgent need to strengthen public health education. Improving community knowledge about dengue symptoms, transmission, and the importance of early medical care can significantly reduce delays in treatment. Educational interventions should be designed to be accessible, culturally appropriate, and targeted, particularly toward high risk groups such as parents and school-aged children. School based health education programs, community outreach, and the use of digital media platforms can play a vital role in disseminating information effectively and consistently.

In addition, strengthening the capacity of primary healthcare services is essential to support early diagnosis and prompt treatment. Health facilities should be equipped with adequate resources and trained personnel to identify warning signs of DHF and provide timely care. The development of community level early warning systems such as symptom monitoring and rapid referral mechanisms can further enhance responsiveness and reduce the likelihood of severe outcomes.

In summary, this study emphasizes that the high mortality rate from DHF in Surakarta in 2024 was largely driven by a lack of community knowledge and delayed treatment seeking behavior. The significant increase in deaths highlights the need to move beyond reactive approaches and adopt more proactive, knowledge based strategies. Strengthening public awareness, targeting vulnerable groups, improving healthcare responsiveness, and fostering collaboration are essential steps to reduce dengue related mortality in the future.

RECOMMENDATIONS

Efforts to reduce dengue fatalities must prioritize closing the critical knowledge gap among patients and their families regarding early symptoms and warning signs of dengue hemorrhagic fever. Public health initiatives should focus on structured, community-based education programs that enhance the recognition of key symptoms such as sudden high fever, muscle pain, and bleeding. Empowering family members as larval monitoring agents and early symptom detectors within households can facilitate timely medical intervention, thereby preventing fatal delays in treatment. These education programs need to be culturally sensitive and sustained over time, using interactive methods and involving schools,

health centers, and local community organizations to maximize reach and impact.

To address the bottleneck in knowledge effectively, health promotion strategies must shift from conventional mosquito control approaches alone, like fogging, towards inclusive knowledge-based interventions fostering early warning awareness. Local governments and health authorities should collaborate to implement ongoing campaigns using social media, seminars, and community workshops that clearly communicate the urgent need for immediate care once symptoms appear. Enhancing trust and access to accurate information, while enabling rapid community response, will ultimately empower families to act decisively, reduce hospitalization delays, and lower dengue mortality rates in endemic areas like Surakarta and similar regions. This strategic investment in health literacy is essential for sustainable dengue control and saving lives.

AUTHOR CONTRIBUTIONS

Akbarudin Arif conceived and designed the study, developed the framework, and wrote the main draft of the manuscript. Kurnia Atika Suri, Sapja Anantanyu, Agus Kristiyanto, Haryani Saptaningtyas, and Suminah were involved in conducting the research and data collection. Akbarudin Arif and Kurnia Atika Suri carried out the data analysis. All authors contributed to the interpretation of the findings, provided critical feedback, and approved the final version of the manuscript.

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REFERENCES

Aldila D (2023). Optimal control for dengue eradication program under the media awareness effect. Int J Nonlinear Sci Numer Simulat. 24(1): 95–122. https://doi.org/10.1515/ijnsns-2020-0142.

Ashari MR, Masluhiya S, Devi HM (2025). Knowledge of dengue hermorrhagic fever and its influnce on 5M-plus practices among housewives. SIKLUS: Journal Research Midwifery Politeknik Tegal. 14(1): 1–8. https://-ejournal.poltekharber.ac.id/index.php/siklus/article/view/6002/pdf.

Asish PR, Dasgupta S, Rachel G, Bagepally BS, Kumar CPG (2023). Global prevalence of asymptomatic dengue infections - a systematic review and meta-analysis. Int J Infectious Dis. 134: 292–298. https://doi.org/10.1016/j.ijid.2023.07.010.

Belo ODS, Pinto J, Da Conseição JX, Oqui M, Da Costa GL (2024). The knowledge of families for dengue haemorrhagic fever prevention at Fatuqueiro Village in Ermera Municipality of Timor Leste. Int J Natural Health Sci. 2(1): 23–30. https://doi.org/10.5989-0/ijnhs.v2i1.1197.

Bowman LR, Donegan S, McCall PJ (2016). Is dengue vector control deficient in effectiveness or evidence?: Systematic review and meta-analysis. PLoS Negl Trop Dis. 10(3). https://doi.org/10.13-71/journal.pntd.0004551.

Creswell JW (2009). Research design qualitative, quantitative, and mixed methods approaches. third. California: SAGE Publications.

da Silva AC, Scalize PS (2023). Environmental Variables Related to Aedes aegypti Breeding Spots and the Occurrence of Arbovirus Diseases. Sustainability (Switzerland). https://doi.org-/10.3390/su15108148.

Dapari R, Jumidey AQ, Manaf RA, Zamzuri MAIA, Hassan MR, Dom NC, Rahim SSSA (2025). School-based health education effect on knowledge, attitude, and practices of dengue prevention among school children: a systematic review. Discov Soc Sci Health. 5(1). https://doi.org/10.1007/s44155-025-00181-w.

Deng J, Zhang H, Wang Y, Liu Q, Du M, Yan W, et al. (2024). Global, regional, and national burden of dengue infection in children and adolescents: an analysis of the Global Burden of Disease Study 2021. EClinicalMedicine. 78:102943. https://doi.org/10.1016/j.eclinm.2024.102943.

Heyrani A, Pourjalil F, Hosseini Z, Shahabi N, Asadipour E (2024). A comprehensive scoping review of global educational strategies and outcomes in aedes-borne disease control. Arch Public Health. 82:176. https://doi.org/10.1186/s13690-024-01412-3.

Jamal MK, Sanaei B, Naderi M, Past V, Abadi SHA, Khazaei R, et al. (2025). Investigating the recent outbreak of dengue fever in Iran: a systematic review. Egyptian J Inter Med. 37. https://doi.org/10.1186/s43162-025-00411-2.

Jayawickreme KP, Jayaweera DK, Weerasinghe S, Warapitiya D, Subasinghe S (2021). A study on knowledge, attitudes and practices regarding dengue fever, its prevention and management among dengue patients presenting to a tertiary care hospital in Sri Lanka. BMC Infect Dis. 21(1):981. https://-doi.org/10.1186/s12879-021-06685-5.

Juhairiyah J, Ridha MR, Indriyati L, Yudhastuti R, Garjito TA, Hidajat MC, et al. (2025). Implementation of insecticide for fogging and larvicidation in dengue fever control and its impact on vector resistance in Banjarmasin City: A Qualitative Analysis. Jurnal Kesehatan Lingkungan. 17(2): 99–109. https://doi.org/10.20473/jkl.v17i2.2025.99-109.

Kanu IM, Sule PC, Chukwurah UA, Murtala A (2024). Enhancing health outcomes through community-based health education programs for underserved populations. World J Advanced Res Rev. 24(3): 3260–3283. https://doi.-org/10.30574/wjarr.2024.24.3.3928.

Llorente-Pérez YJ, Rodríguez-Acelas AL, Cañon-Montañez W (2023). Educational interventions for the prevention and control of dengue in adults: An integrative review. Enferm Clin (Engl Ed). 33(2): 157–166. https://doi.org/-10.1016/j.enfcle.2022.10.005.

Loasana NA (2024). Warmer rainy season triggers dengue spike across Indonesia. [internet]. The Jakarta Pos.

Lusno MFD, Haksama S, Yudhastuti R, Zubaidah S, Al-Mamun A, Tarawally A, et al. (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 Afr Med J. 47:185. https://doi.org/10.-11604/pamj.2024.47.185.43298.

Mohamed RAEH, Khan Y, Alzahrani KJ, Alzahrani FM, Alsharif KF, Khan A, et al. (2025). Knowledge, attitudes, and practices regarding dengue and its vectors among medical professionals: a cross-sectional study. Front Cell

Infect Microbiol. 15:1560054. https://doi.org/10.3389/fcimb.2025.1560054.

Oktaviana E (2024). The level of knowledge regarding dengue hemorrhagic fever. Genius J General Nurs Sci J. 05(01): 12–18. https://doi.org/10.56359/gj.

Permatasari CI, Kesetyaningsih TW (2022). The Knowledge about fogging to prevent DHF in urban and rural communities in Bantul Regency, Yogyakarta, Indonesia. In Proceedings of the International Conference on Sustainable Innovation on Health Sciences and Nursing. Atlantis Press International BV: 64–74. https://doi.org/10.2991/978-94-6463-070-1_10.

Reza SB, Shoukhin MMUR, Khan SA, Dewan SMR (2024). Dengue outbreak 2023 in Bangladesh: From a local concern to a global public health issue. Sci Prog. 107(4): 368504241289462. https://doi.org/10.1177/00368504241289462.

Riaz M, Harun SNB, Mallhi TH, Khan YH, Butt MH, Husain A, et al. (2024). Evaluation of clinical and laboratory characteristics of dengue viral infection and risk factors of dengue hemorrhagic fever: a multi-center retrospective analysis. BMC Infect Dis. 24(1):500. https://doi.org/10.1186/s12879-024-09384-z.

Rossana LS, Katty EV, Mayra BL (2025). Knowledge, attitudes, and practices for the prevention and vector control of dengue in a Colombian rural population: A mixed method study. SAGE Open Nursing, 11. https://doi.org/10.1177/23779608241302713.

Samsudin NA, Karim N, Othman H, Naserrudin NA, Sahani M, Hod R, et al. (2024). Exploring community behaviours and stakeholder challenges in engaging communities with dengue prevention behaviour in Malaysia: implementation research for a qualitative study with a community-based participatory research design. BMJ Open. 14(3). https://doi.org/10.1136/bmjopen-2023-074222.

Samsudin NA, Othman H, Siau CS, Zaini ZII (2024). Exploring community needs in combating aedes mosquitoes and dengue fever: a study with urban community in the recurrent hotspot area. BMC Public Health, 24(1): 1651. https://doi.org/10.1186/s12889-024-18965-1.

Seid M, Aklilu E, Animut A (2024). Spatio-temporal occurrence and habitat characteristics of Aedes aegypti (Diptera: Culicidae) larvae in Southern Afar region, Ethiopia. Trop Med Health. 52(1). https://doi.org/10.1186/s41182-024-00612-5.

Selvarajoo S, Liew JWK, Tan W, Lim XY, Refai WF, Zaki RA, et al. (2020. Knowledge, attitude and practice on dengue prevention and dengue seroprevalence in a dengue hotspot in Malaysia: A cross-sectional study. Sci Rep. 10(1): 9534. https://doi.org/10.1038/s41598-020-66212-5.

Sulistyawati S, Astuti FD, Umniyati SR, Satoto TBT, Lazuardi L, Nilsson M, et al. (2019). Dengue vector control through community empowerment: Lessons learned from a community-based study in Yogyakarta, Indonesia. Int J Environ Res Public Health. 16(6). https://doi.org/10.3390/ijerph16061013.

Suwantika AA, Kautsar AP, Supadmi W, Zakiyah N, Abdulah R, Ali M, Postma MJ (2020). Cost-effectiveness of dengue vaccination in Indonesia: Considering integrated programs with wolbachia-infected mosquitos and health education. Int J Environ Res

Public Health. 17(12): 1–15. https://-doi.org/10.3390/ijerph17124217.

Tantawichien T (2012). Dengue fever and dengue haemorrhagic fever in adolescents and adults. Paediatr Int Child Health. 32(1): 22–27. https://doi.org-/10.1179/2046904712Z.00000000049.

Usuga AF, Zuluaga-Idárraga LM, Alvarez N, Rojo R, Henao E, Rúa-Uribe GL (2019). Barriers that limit the implementation of thermal fogging for the control of dengue in Colombia: A study of mixed methods. BMC Public Health. 19(1):669. https://doi.org/10.1186/s1-2889-019-7029-1.

World Health Organization (2025) Dengue and severe dengue. Retrieved from https://www.who.int/health-topics/-dengue-and-severe-dengue.

Yulfi H, Panggabean M, Darlan DM, Siregar ISS, Rozi MF (2025). Community-based intervention in mosquito control strategy: A systematic review. Narra J. 5(1); e1015. https://doi.org/-10.52225/narra.v5i1.1015.