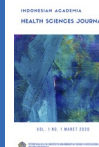




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Clean and Healthy Living Behavior for the Prevention of Dengue Hemorrhagic Fever in the Urban Community: A Descriptive Cross-Sectional Study

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Abstract

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Background: Household environmental management and sustained preventive behavior remain central to dengue control, particularly in densely populated urban settings. *Objective:* To describe community knowledge, attitudes, and practices related to Clean and Healthy Living Behavior for dengue prevention in the Wonokusumo Public Health Center catchment area, Surabaya. *Methods:* A descriptive cross-sectional study was conducted from 7 to 13 August 2023 among 167 household representatives aged 26–70 years in RW 10, Wonokusumo. Participants were recruited using purposive sampling. Data were collected using a structured questionnaire adapted from established dengue knowledge, health-belief, and prevention-practice instruments. Knowledge, attitude, and practice were summarized using frequencies and percentages. *Results:* Most respondents had good knowledge (127/167; 76.0%) and a positive attitude toward dengue prevention (135/167; 80.8%). However, more than half had poor preventive practices (87/167; 52.0%); only 55 respondents (33.0%) were categorized as having good practices. Respondents were predominantly male (62.2%), aged 37–47 years (38.0%), educated to senior high-school level (45.0%), and married (82.0%). *Conclusion:* The community demonstrated a clear knowledge–practice gap: favorable knowledge and attitudes had not consistently translated into routine household dengue prevention. Community nursing programs should move beyond information delivery toward repeated household monitoring, practical demonstrations, family participation, and coordinated action with local health volunteers and community leaders.

Keywords: clean and healthy living behavior; community nursing; dengue prevention; knowledge; attitude; practice

INTRODUCTION

Dengue is a mosquito-borne viral infection transmitted mainly by *Aedes aegypti* and remains a major public health threat in tropical and subtropical regions. The global burden has increased markedly, with 14.6 million cases and more than 12,000 dengue-related deaths reported in 2024, the highest annual total recorded by the World Health Organization (World Health Organization [WHO], 2025). Indonesia experiences year-round transmission; as of 1 July 2024, 149,866 confirmed cases and 884 deaths had been reported across all 38 provinces (WHO, 2024). These trends reinforce the need for sustained prevention at household and community levels.

Dengue control depends heavily on reducing mosquito breeding sites and preventing human–vector contact. In Indonesia, household measures are commonly framed through 3M Plus: routinely draining water containers, tightly covering water storage, recycling or removing items that can collect water, and adding complementary measures such as larval monitoring, repellents, screens, and community mosquito-nest eradication. These actions are closely aligned with Clean and Healthy Living Behavior, locally known as *Perilaku Hidup Bersih dan Sehat* (PHBS), which emphasizes individual and collective responsibility for maintaining a healthy home environment.

Knowledge and favorable attitudes are necessary foundations for prevention, but they do not automatically produce consistent behavior. Indonesian studies have reported substantial variation in dengue knowledge, attitudes, and practices, including situations in which knowledge or perceived severity was relatively high while routine larval inspection and environmental management remained incomplete (Harapan et al., 2018; Rakhmani & Zuhriyah, 2024). A recent national assessment similarly identified important gaps across dengue knowledge, attitudes, and practices and recommended integrated strategies combining education, vector control, and wider health-system support (Prayitno et al., 2025).

Wonokusumo is a densely populated urban area in Surabaya where household water storage, waste management, ventilation, hanging clothes, and the presence of stagnant water may influence mosquito breeding and exposure. Preliminary observations in

RW 10 indicated inconsistent environmental cleaning and water-container management. Local evidence describing what residents know, how they perceive prevention, and what they actually do is therefore needed to guide community nursing and public health interventions. This study aimed to describe knowledge, attitudes, and PHBS-related practices for dengue prevention among community members in the Wonokusumo Public Health Center catchment area.

METHODS

Study Design and Setting

This descriptive cross-sectional study was conducted in RW 10, Wonokusumo Urban Village, Semampir District, Surabaya, within the Wonokusumo Public Health Center catchment area. Data collection took place from 7 to 13 August 2023. The study focused on one household representative from each participating family.

Participants and Sampling

The source population comprised 200 household representatives residing in RW 10. Eligible participants were men or women aged 26–70 years who represented their household and were willing to participate. Individuals who declined participation or were unable to complete the questionnaire cooperatively were excluded. A sample of 167 respondents was recruited using purposive sampling based on these eligibility criteria.

Instrument and Measurement

Data were collected using a structured questionnaire adapted from established community dengue knowledge, health-belief, and prevention-practice instruments developed by Wong et al. (2014) and applied in subsequent community prevention research by Chandren et al. (2015). The instrument contained 17 knowledge items, three attitude items, and 17 practice items covering dengue transmission, signs and symptoms, water-container management, larval control, environmental cleaning, personal protection, and participation in prevention activities.

Knowledge items were answered as yes, no, or do not know; correct responses received one point and incorrect or uncertain responses received zero. Knowledge scores were categorized as good (76%–100%), moderate (56%–75%), or poor ($\leq 55\%$).

Attitude items used a four-point response scale and were categorized as positive or negative using the study cut-off of 50%. Practice items used a four-point frequency scale ranging from never to always and were categorized as good (76%–100%), moderate (60%–75%), or poor (<60%).

Data Collection and Analysis

A trained research assistant with a nursing background supported data collection. Ninety respondents completed the questionnaire at a community meeting point near the RW leader's residence, while 77 were approached through household visits. Before questionnaire completion, the study procedures were explained and written informed consent was obtained. Completed questionnaires were checked for completeness and coded without participants' names. Data were analyzed descriptively using frequencies and percentages.

RESULTS

All 167 completed questionnaires were included in the analysis. Respondents were predominantly male (62.2%), and the largest age group was 37–47 years (38.0%). Almost half had completed senior high school (45.0%), 35.0% worked as traders, 82.0% were married, and 64.0% reported a monthly household income of IDR 1–2 million (Table 1).

Table 1. Respondent characteristics (N = 167)

Characteristic	Category	n	%
Sex	Male	104	62.2
	Female	63	37.8
Age, years	26–36	33	19.7
	37–47	63	38.0
	48–58	46	27.5
	59–69	20	11.9
	70	5	2.9
Education	Primary school	30	18.0
	Junior high school	36	21.5
	Senior high school	75	45.0
	Bachelor's degree	26	15.5
Occupation	Civil servant	28	17.0
	Private employee	45	27.0
	Trader	58	35.0
	Laborer	27	16.1
	Homemaker	9	5.3
Marital status	Married	137	82.0
	Widowed/divorced	30	18.0

Characteristic	Category	n	%
Monthly income	IDR 1–2 million	107	64.0
	> IDR 3 million	60	36.0

Note. Percentages may not sum to exactly 100 because of rounding.

Regarding dengue prevention, 127 respondents (76.0%) had good knowledge and 135 (80.8%) had a positive attitude. In contrast, preventive practices were categorized as poor for 87 respondents (52.0%), moderate for 25 (15.0%), and good for 55 (33.0%) (Table 2). Thus, the dominant pattern was favorable knowledge and attitudes accompanied by inadequate routine preventive action.

Table 2. Knowledge, attitudes, and practices related to dengue prevention (N = 167)

Domain	Category	n	%
Knowledge	Good	127	76.0
	Moderate	28	16.8
	Poor	12	7.2
Attitude	Positive	135	80.8
	Negative	32	19.2
Preventive practice	Good	55	33.0
	Moderate	25	15.0
	Poor	87	52.0

DISCUSSION

This study identified a marked knowledge–practice gap in household dengue prevention. Three quarters of respondents had good knowledge and more than four fifths expressed positive attitudes, yet 52.0% reported poor preventive practices. The findings suggest that awareness and endorsement of prevention were not sufficient to ensure that recommended behaviors were performed routinely. For community nursing, the central issue is therefore not only whether residents understand dengue, but whether households have the motivation, opportunity, support, and repeated reinforcement needed to sustain environmental action.

The high proportion of respondents with good knowledge may reflect repeated exposure to dengue information through public health campaigns, health workers, neighborhood communication, and personal experience in an endemic city. Nevertheless, knowledge levels vary substantially across settings. In Aceh, only 45% of participants had good dengue knowledge, and good attitudes and

practices were each reported by approximately one third of participants (Harapan et al., 2018). A national Indonesian survey also found uneven KAP performance and emphasized the need for integrated education, vector control, and vaccination strategies rather than relying on a single approach (Prayitno et al., 2025). Differences in populations, instruments, cut-offs, and information access may partly explain variation between studies.

The poor practice level in Wonokusumo is consistent with evidence that preventive behavior often lags behind knowledge. Among health volunteers in urban Malang, 62.8% performed dengue prevention practices infrequently, and knowledge was associated with attitude but not directly with practice; a more positive attitude was associated with better prevention behavior (Rakhmani & Zuhriyah, 2024). Earlier research in Malang likewise showed that prevention was shaped by age, sex, length of residence, household size, and perceived susceptibility, underscoring that behavior is influenced by social and contextual factors as well as information (Rakhmani et al., 2018). Similar international studies have found that risk perception, perceived mosquito density, and practical barriers influence household action (Chandren et al., 2015; Wong et al., 2015).

Several mechanisms may explain the mismatch observed in this study. Water-container cleaning, larval inspection, waste removal, and reduction of indoor mosquito-resting sites require repeated effort, shared household responsibility, and enabling environmental conditions. A resident may agree that prevention is important but still postpone action because of limited time, competing work demands, insufficient family cooperation, or the belief that fogging is the primary solution. The study area also included many traders and lower-income households, which may affect the time and resources available for routine environmental management; however, these explanations should be interpreted cautiously because this study did not test determinants statistically.

Evidence from publications provides useful complementary perspectives on how infectious-disease prevention can be strengthened. In Surabaya, Mukarromah et al. (2023) highlighted the roles of family belief systems, organizational patterns, communication processes, and the family's capacity to control infection. Winata et al. (2023)

showed that social and familial factors, community values, economic conditions, and knowledge shape the acceptance and implementation of tuberculosis elimination activities. At a broader level, Nursalam et al. (2025) emphasized interprofessional collaboration and cross-sector community coordination as foundations of community resilience. Although these studies addressed COVID-19 and tuberculosis rather than dengue, the mechanisms are transferable: prevention is more likely to be sustained when families communicate clearly, community leaders reinforce shared norms, health workers coordinate with local sectors, and residents participate as active partners.

The practical implication is that dengue programs in Wonokusumo should shift from episodic counseling toward behavior-focused community engagement. Public health nurses and mosquito-larva monitoring volunteers can combine brief education with household demonstrations, scheduled container inspection, visual reminders, feedback on larval findings, and family task allocation. Monthly neighborhood clean-up activities should be linked to 3M Plus monitoring rather than conducted only during outbreaks. Community leaders can publicly reinforce expectations, while health-center staff can identify households requiring additional support. These measures align with evidence that community capacity and regular volunteer training are important for sustainable dengue prevention (Rakhmani & Zuhriyah, 2024; Winata et al., 2023).

This study has several limitations. Its descriptive cross-sectional design precludes causal interpretation and does not identify predictors of poor practice. Participants came from one urban neighborhood, which limits generalizability to other communities. Knowledge, attitudes, and practices were self-reported and may be affected by recall or social-desirability bias. The study did not include direct household observations, larval indices, or documented dengue outcomes, and psychometric testing of the adapted questionnaire was not reported in the thesis. Future studies should combine validated KAP measures with household observation and entomological indicators and use analytic or longitudinal designs to determine which family, environmental, and service factors most strongly influence sustained preventive behavior.

CONCLUSION

Community members in RW 10, Wonokusumo, generally demonstrated good knowledge and positive attitudes toward dengue prevention, but most had not translated these favorable perceptions into adequate routine practice. The findings indicate that information alone is insufficient. Community nursing interventions should emphasize repeated practical action, household responsibility, larval monitoring, family communication, and coordinated participation by health workers, volunteers, and neighborhood leaders. Future research should objectively assess household conditions and evaluate whether structured community-based interventions improve both preventive behavior and vector-control indicators.

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