

Knowledge, Attitude, and Preventive Practices Regrading Dengue Fever Among Urban Households

Pushendra Deshmukh

Student, Faculty of science, SAM Global University, Raisen, M.P., India

Dr. Priyanka Tiwari

Professor, Faculty of science, SAM Global University, Raisen, M.P., India

Abstract

Dengue fever is a major mosquito-borne viral disease of public health importance in tropical and subtropical regions. It is transmitted primarily by infected female *Aedes* mosquitoes and is closely associated with urban and semi-urban environments, household water storage and community-level vector control behaviour.^{1,2} Although municipal services and clinical management remain important, prevention ultimately depends on household knowledge, risk perception, attitude toward source reduction and regular preventive practices. A community-based cross-sectional study design was used among 200 urban households. Data were collected through a structured questionnaire containing sociodemographic details, household environmental characteristics, knowledge items, attitude statements and preventive practice questions. Scores were classified into good, moderate and poor levels for knowledge and practices, and favourable, neutral and unfavourable levels for attitude. Descriptive statistics, chi-square tests and correlation analysis were applied. Among 200 respondents, 38.0% had good knowledge, 44.0% had moderate knowledge and 18.0% had poor knowledge. A favourable attitude was observed in 57.5% of respondents, while good preventive practices were reported by 36.0%. Covered water storage, weekly drying of containers, use of mosquito repellents and removal of stagnant water were common practices, but gaps remained in larval source identification, daytime biting awareness and sustained community participation.

Keywords: Dengue fever, Knowledge, Attitude, Preventive practices

I. INTRODUCTION

Dengue fever has emerged as one of the most important arboviral diseases affecting urban populations. The infection is caused by dengue virus and transmitted mainly through the bite of infected female *Aedes* mosquitoes, particularly *Aedes aegypti*. The disease is strongly linked with human settlement patterns, household water storage, inadequate solid-waste management and community behaviour. Since *Aedes* mosquitoes commonly breed in clean stagnant water around houses, dengue control cannot depend only on fogging or clinical care. It requires informed households that recognize breeding sites, protect themselves from bites and participate in routine source reduction.

Overview of Dengue Fever

Dengue fever usually presents as an acute febrile illness with headache, retro-orbital pain, myalgia, arthralgia, rash, nausea and vomiting. Many infections remain asymptomatic or mild, but a proportion may progress to severe dengue with plasma leakage, bleeding, organ involvement or shock. There is no specific antiviral treatment for dengue and management is mainly supportive, based on early recognition of warning signs, careful fluid management and

timely referral. For this reason, preventive practices at household level are central to reducing infection risk before disease occurs.

Epidemiology of Dengue Fever

The epidemiology of dengue is shaped by the interaction between virus, vector, human host and environment. Transmission is favoured by warm temperatures, rainfall, humidity, water storage and high human-vector contact. WHO estimates that about half of the world population is now at risk of dengue, with 100-400 million infections occurring each year, and the disease is common in tropical and subtropical climates, mostly in urban and semi-urban areas.¹ The global expansion of Aedes vectors has made dengue an increasing public health concern in many regions.

II. LITERATURE REVIEW

Global Burden of Dengue Fever

Dengue has increased substantially over recent decades due to urbanization, population mobility, climatic suitability and spread of Aedes vectors. WHO states that about half of the world's population is now at risk and that 100-400 million infections may occur annually.¹ Bhatt et al. estimated a large global burden of dengue infection and highlighted the difference between apparent clinical disease and total infections. The global burden is especially significant in Asia, Latin America and parts of Africa where vector and environmental conditions support transmission.

Dengue Fever in India

India reports dengue from many states and union territories, with seasonal peaks commonly following monsoon periods. The National Center for Vector Borne Diseases Control provides information on the dengue situation in India and describes prevention through vector control, personal protection and community participation. Urban expansion, construction activity, water storage practices and high population density contribute to dengue risk. The Indian context also requires integration of clinical guidelines with community-based prevention because hospital management alone cannot reduce mosquito breeding.

Clinical Features and Complications of Dengue Fever

Dengue infection ranges from asymptomatic disease to severe dengue. Common symptoms include sudden fever, severe headache, retro-orbital pain, body ache, rash, nausea, vomiting and weakness. Severe dengue may involve bleeding, plasma leakage, severe abdominal pain, persistent vomiting, lethargy, hepatomegaly and shock. The National Guidelines for Clinical Management of Dengue Fever 2023 emphasize early recognition, classification and supportive care to reduce mortality. Community knowledge of warning signs helps timely care seeking.

Risk Factors Associated with Dengue Fever

Risk factors for dengue include presence of Aedes breeding sites, uncovered water storage, poor waste management, inadequate drainage, previous local transmission, high density housing, lack of personal protection and low community participation. Risk also increases when households are aware of dengue but delay action until cases appear. Environmental risk and behavioural risk are closely linked in urban areas because domestic containers may become vector habitats within a short time after water collection or rainfall.

Knowledge Regarding Dengue Fever among Community Members

KAP studies generally show that many community members know dengue is mosquito-borne, but fewer know the exact breeding habits and daytime biting pattern of *Aedes* mosquitoes. Inadequate knowledge of breeding sites reduces the effectiveness of household prevention. Ahmed et al. reported variable KAP levels and emphasized that correct knowledge is necessary but not sufficient for prevention.⁷ Knowledge must therefore be converted into practical actions such as weekly source reduction and container management.

Attitude towards Dengue Prevention and Control

Attitude determines whether households consider dengue preventable, perceive the disease as serious and feel responsible for reducing mosquito breeding. Positive attitudes are often associated with willingness to clean surroundings, cooperate with health workers and participate in community campaigns. However, some studies show a gap between favourable attitudes and actual practices because of inconvenience, time constraints, cost of repellents, limited municipal support or belief that fogging is the primary solution.

Preventive Practices against Dengue Fever

Preventive practices include covering water containers, emptying and scrubbing containers weekly, cleaning coolers, changing flower-vase water, disposing of unused items, using mosquito nets or repellents, installing screens and seeking early medical care for fever. CDC and WHO emphasize mosquito bite prevention and vector control as key components of dengue prevention. Regularity of practice is more important than one-time action because *Aedes* breeding can recur quickly after rainfall or water storage.

Household-Level Mosquito Breeding Prevention

Household-level breeding prevention is central because many *Aedes* breeding sites are small, hidden and domestic. Buckets, drums, overhead tanks, coolers, flower pots, discarded cups, tyres and plastic containers can support larvae. Source reduction requires direct household participation because municipal teams may not access all indoor or rooftop locations. The practice of a weekly dry day is particularly useful because it interrupts the mosquito life cycle before adult emergence.

Role of Urban Households in Dengue Control

Urban households are both beneficiaries and active participants in dengue control. Their responsibilities include maintaining clean surroundings, reporting fever, accepting health worker visits, cooperating with anti-larval measures and sharing prevention messages with neighbours. Household action has collective value because mosquito breeding in one house can affect nearby houses. Community participation strategies under public health programmes recognize that dengue cannot be controlled only by top-down spraying or emergency response.

Barriers to Dengue Prevention

Practices Barriers include lack of precise knowledge, low risk perception, irregular water supply, shortage of covered containers, overcrowding, poor waste collection, construction debris, reliance on fogging, cost of personal protection, and limited time for weekly cleaning. Tenants may have limited control over building structure or water storage, while apartment

residents may depend on common maintenance. These barriers should be considered while interpreting practice scores.

III. MATERIALS AND METHODS

Study Design

A community-based cross-sectional descriptive study design was adopted. This design was appropriate because the study aimed to assess existing knowledge, attitude and preventive practices at a single point of time among selected urban households. The design also allowed analysis of associations between KAP levels and selected sociodemographic or household environmental variables.

Study Area/Study Setting

The study was conducted in selected urban residential wards. The area included mixed housing patterns such as independent houses, rented houses and apartments. The setting was selected because urban households commonly store water, use coolers, maintain rooftop tanks and generate domestic waste, all of which may influence dengue prevention practices.

Study Population

The study population consisted of adult household respondents residing in selected urban households. One adult respondent from each household was included. The respondent was preferably the person involved in household water management, cleaning decisions or health-related decisions.

Study Duration

The study duration was six months, including tool preparation, validation, pilot testing, data collection, data entry, analysis and thesis writing. Data collection was planned during a period when dengue awareness activities are commonly relevant in urban communities.

Sample Size

The sample size was 200 urban households. The sample was considered adequate for descriptive KAP assessment and for examining associations using chi-square tests across major socio-demographic categories. A household was treated as the unit of study, and one eligible respondent was interviewed from each household.

Sampling Technique

A multistage sampling approach was used. Urban wards were selected purposively based on feasibility and dengue relevance. Within selected wards, lanes or clusters were selected and households were approached systematically. If an eligible respondent was unavailable or declined participation, the next household was approached.

Inclusion Criteria

Households were included if an adult respondent aged 18 years or above was available, had resided in the urban area for at least six months, was willing to provide informed consent, and was able to understand and respond to the questionnaire.

Exclusion Criteria

Households were excluded if no adult respondent was available after repeated visit, the respondent was severely ill or unable to participate, the household was temporarily occupied, or the respondent declined informed consent.

Study Variables

The dependent variables were knowledge regarding dengue fever, attitude towards dengue prevention and preventive practices regarding dengue fever. Independent variables included age, gender, educational status, occupation, socioeconomic status, type of housing, source of water storage, previous history of dengue in family and source of health information.

Data Collection Tool

A structured questionnaire was used for data collection. It consisted of four parts: socio-demographic profile, knowledge section, attitude section and preventive practice section. The tool was prepared after reviewing dengue guidelines, health education materials and similar KAP studies.

Description of Questionnaire

The questionnaire included close-ended questions to allow uniform scoring and comparison. It was prepared in simple language suitable for community respondents. The questionnaire was pretested during the pilot study and modified for clarity, sequence and relevance.

Method of Data Collection

Data were collected through face-to-face interviews after obtaining informed consent. The purpose of the study was explained to respondents, confidentiality was assured and respondents were informed that participation was voluntary. Each interview took approximately 15 to 20 minutes.

Pilot Study

A pilot study was conducted among 20 households not included in the final sample. The pilot study assessed feasibility, clarity of questions, approximate time required and respondent understanding. Minor wording changes were made based on pilot feedback.

Validity and Reliability of Tool

Content validity was established through review by public health and community medicine experts. Reliability of the knowledge and practice sections was assessed using internal consistency methods during pilot testing. Items with unclear wording were revised.

Ethical Considerations

Ethical principles of voluntary participation, informed consent, confidentiality, privacy and non-maleficence were followed. No invasive procedure or biological sample was collected. Respondents were not identified by name in the analysis.

IV. DATA ANALYSIS AND INTERPRETATION

Findings are organized according to socio-demographic profile, household environmental characteristics, knowledge, attitude, preventive practices, source of information, association between variables and correlation among knowledge, attitude and preventive practice scores. Frequencies and percentages are presented for descriptive data, and p-values are presented for inferential analysis.

Table 1: Distribution of Respondents According to Socio-Demographic Characteristics

Variable	Category	Frequency (n=200)	Percentage
Age	18-30 years	62	31.0
Age	31-45 years	72	36.0
Age	46-60 years	44	22.0
Age	>60 years	22	11.0
Gender	Male	94	47.0
Gender	Female	106	53.0
Education	Up to primary	26	13.0
Education	Secondary	58	29.0
Education	Graduate and above	78	39.0
Education	No formal education	38	19.0
Occupation	Homemaker	62	31.0
Occupation	Service/business	70	35.0
Occupation	Student	22	11.0
Occupation	Daily wage/other	46	23.0

Table 1 shows that most respondents belonged to the 31-45 year age group, followed by the 18-30 year age group. Female respondents were slightly more represented than male respondents because household health and water storage decisions were often managed by women during data collection. A considerable proportion of respondents had secondary or higher education, which may influence understanding of health messages. The occupational distribution was mixed, indicating that dengue prevention messages need to reach working adults, homemakers, students and informal workers.

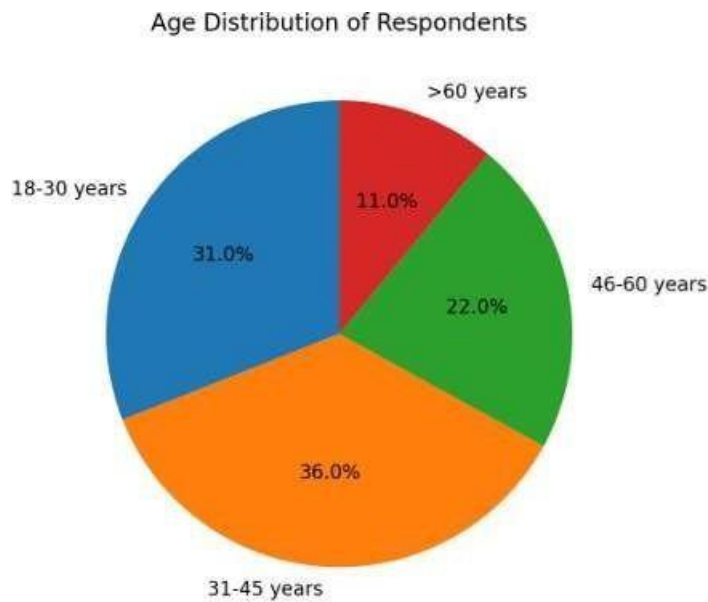


Figure 1: Age Distribution of Respondents

Table 2: Household Environmental Characteristics of Urban Households

Characteristic	Category	Frequency	Percentage
Type of housing	Independent house	86	43.0
Type of housing	Rented house	62	31.0
Type of housing	Apartment/flat	52	26.0
Water storage	Covered containers	136	68.0
Water storage	Uncovered/partly covered containers	64	32.0
Cooler present	Yes	98	49.0
Rooftop tank	Yes	116	58.0
Visible stagnant water nearby	Yes	78	39.0
Previous dengue in family	Yes	42	21.0

Table 2 indicates that water storage was common in the study area. Although 68.0% of households reported covered storage, nearly one-third had uncovered or partly covered containers. Coolers, rooftop tanks and nearby stagnant water were important environmental risk points. A previous family history of dengue was reported by 21.0% of households, suggesting that a substantial group had personal experience with the disease. These findings

indicate that household environment remains a key determinant of dengue risk in urban settings.

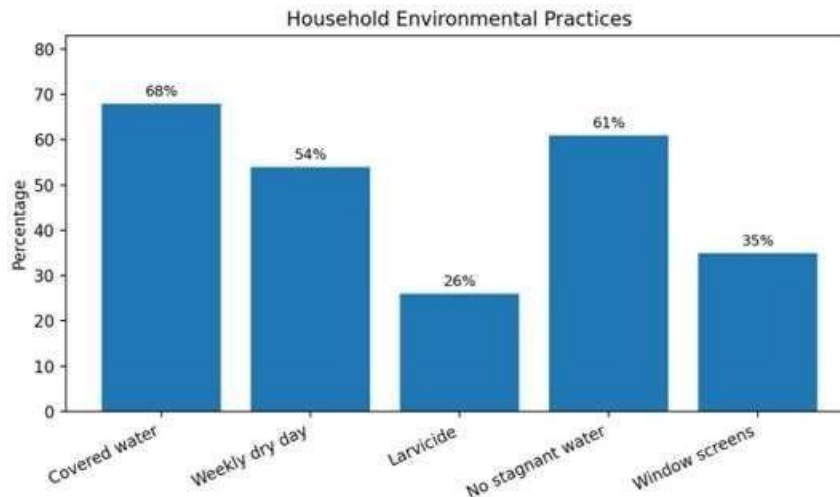


Figure 2: Household Environmental Practices

Table 3: Knowledge Regarding Dengue Fever

Knowledge Item	Correct Response n (%)	Incorrect/Do Not Know n (%)
Dengue is caused by a virus	116 (58.0)	84 (42.0)
Dengue is transmitted by mosquito bite	184 (92.0)	16 (8.0)
Aedes mosquito is involved in dengue transmission	132 (66.0)	68 (34.0)
Dengue can become severe if warning signs are ignored	148 (74.0)	52 (26.0)
There is no specific home medicine that cures dengue	121 (60.5)	79 (39.5)

Knowledge regarding mosquito transmission was high, but knowledge regarding viral cause and Aedes vector was comparatively lower. This shows that public messages have successfully communicated that mosquitoes transmit dengue, but detailed knowledge about the vector and disease mechanism remains incomplete. Since prevention depends on understanding the vector's breeding behaviour, general awareness should be supplemented with specific household action messages.

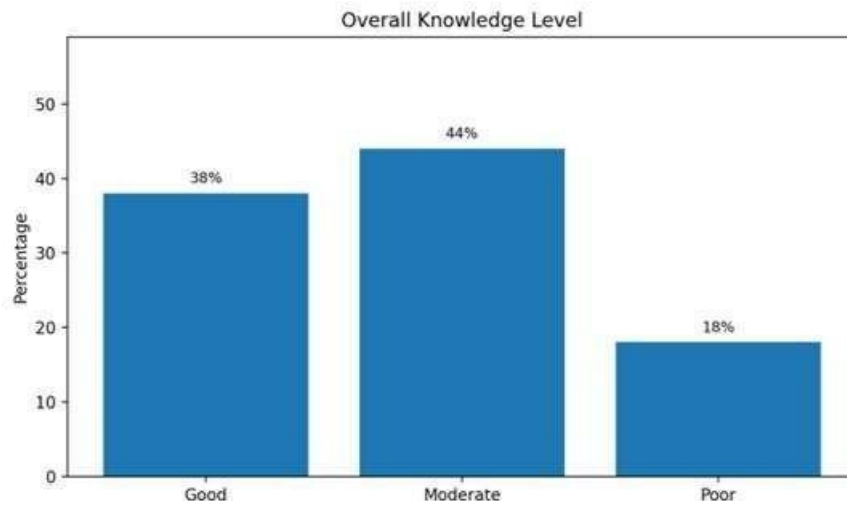


Figure 2: Overall Knowledge Level

Table 4: Knowledge Regarding Dengue Transmission

Transmission Knowledge Item	Correct n (%)	Incorrect/Do Not Know n (%)
Aedes mosquito commonly bites during daytime	102 (51.0)	98 (49.0)
Dengue does not spread by casual contact	118 (59.0)	82 (41.0)
Mosquito can transmit dengue after biting an infected person	128 (64.0)	72 (36.0)
Clean stagnant water can support breeding	139 (69.5)	61 (30.5)
Dengue transmission increases when breeding sites are present near homes	166 (83.0)	34 (17.0)

Only about half of respondents correctly knew that Aedes mosquitoes bite during the daytime. This is a significant knowledge gap because many households use mosquito nets mainly at night and may underestimate daytime bite prevention. Knowledge that clean stagnant water can support breeding was better, but not universal. Health education should therefore emphasize the difference between dengue vectors and nuisance mosquitoes that are usually noticed at night.

V. RESULTS

Major Findings Related to Socio-Demographic Profile

The highest proportion of respondents was in the 31-45 year age group, followed by the 18-30 year group. Female respondents were slightly more represented than male respondents. Most respondents had secondary or higher education, while a smaller but important proportion had no formal education or only primary education. Occupation varied across homemakers, service or business workers, students and daily wage or other workers. These characteristics indicate that health education should be designed for a mixed urban population rather than a single social group.

Major Findings Related to Household Environment

Environmental findings showed that water storage was common and that nearly onethird of households stored water in uncovered or partly covered containers. Coolers, rooftop tanks and visible stagnant water around the house were also present in many households. A previous history of dengue in the family was reported by about one-fifth of respondents. These findings confirm that dengue risk in urban households is closely connected with domestic water management and environmental hygiene.

Major Findings Related to Knowledge Regarding Dengue Fever

Knowledge was good in 38.0%, moderate in 44.0% and poor in 18.0% of respondents. Most respondents knew that dengue is transmitted by mosquitoes and recognized high fever and body ache as symptoms. However, fewer respondents correctly knew that dengue is caused by a virus, that Aedes mosquitoes are responsible for transmission and that they commonly bite during the daytime. Knowledge of warning signs such as persistent vomiting, abdominal pain and lethargy was also limited.

Major Findings Related to Attitude towards Dengue Prevention

Attitude toward dengue prevention was favourable in 57.5% of respondents, neutral in 32.5% and unfavourable in 10.0%. Most respondents agreed that dengue is serious, preventable and that every family has responsibility for preventing mosquito breeding. Respondents also supported community participation and school or local group involvement. However, some were uncertain about allowing health worker inspection or investing time in weekly cleaning.

Major Findings Related to Preventive Practices

Good preventive practices were reported by 36.0% of households, moderate practices by 43.0% and poor practices by 21.0%. Covering water containers and seeking medical care for persistent fever were relatively common practices. Weekly emptying and scrubbing of containers, cooler cleaning, rooftop tank checks and flower-pot water change were less consistent. These results show that practice levels were lower than attitude levels and that behaviour change requires more than awareness.

VI. DISCUSSION

Discussion of Socio-Demographic Findings

The predominance of adults aged 31-45 years reflects the participation of household decision-makers. Female respondents were slightly more common, which is relevant because women often manage stored water, household cleaning and child health decisions. Education emerged as an important factor associated with knowledge and practice. This is consistent with the public health understanding that education improves access to information, comprehension of

risk and adoption of preventive behaviour. However, dengue messages should be simple enough to reach households with low literacy.

Discussion of Household Environmental Factors

The study found that water storage, coolers, rooftop tanks and stagnant water were common in urban households. These findings are important because *Aedes* mosquitoes breed in domestic and peri-domestic containers. The presence of uncovered or partly covered water containers increases risk even when households are generally aware of dengue. Urban water supply problems may compel households to store water, making complete elimination of containers unrealistic. Therefore, public health advice should focus on safe storage, covering, weekly emptying and scrubbing.

Discussion of Knowledge Regarding Dengue Fever

Knowledge that mosquitoes transmit dengue was high, but knowledge of the *Aedes* vector, daytime biting and warning signs was lower. Similar patterns are reported in many KAP studies, where broad awareness is higher than specific preventive knowledge. This distinction matters because households may use night-time protection while ignoring daytime bites, or may remove dirty water while overlooking clean stored water. Health education should therefore focus on practical and specific messages, not only general disease awareness.

Discussion of Attitude towards Dengue Prevention

Attitude was generally favourable, with most respondents agreeing that dengue is serious and preventable. This is encouraging because positive attitude can support behaviour change. However, attitude did not completely translate into good practices. Some respondents believed municipal action was the main solution, while others were uncertain about health worker inspection. This suggests that dengue control programmes must build trust, clarify household responsibility and reduce inconvenience associated with preventive action.

Discussion of Preventive Practices among Urban Households

Preventive practices were moderate. Covering water containers was more common than weekly emptying and scrubbing. This finding is important because *Aedes* eggs may remain attached to container surfaces, and simple refilling without scrubbing may not interrupt the life cycle. Cooler cleaning, rooftop tank checks and flower-pot water change were also inconsistent. Practice gaps may reflect lack of time, limited access to rooftop tanks, rental housing barriers, cost of protective measures or low perceived immediate risk when no outbreak is visible.

Discussion of Association between Knowledge, Attitude, and Practices

Knowledge, attitude and practice scores were positively correlated. This supports the KAP model, where better knowledge contributes to more favourable attitude and improved practices. However, the correlations were moderate, meaning that other factors also influence behaviour. Behavioural change depends on enabling conditions such as covered containers, waste removal, regular water supply, health worker visits, community norms and municipal support. Public health interventions should therefore combine education with enabling environmental action.

VII. CONCLUSION

The study concluded that urban households had moderate knowledge, generally favourable attitude and moderate preventive practices regarding dengue fever. Most respondents were aware that dengue is mosquito-borne, but knowledge of Aedes biting time, warning signs and hidden breeding sites was incomplete. Preventive practices were not performed consistently, especially weekly emptying and scrubbing of containers, cooler cleaning and rooftop tank checks. Education, previous dengue history, housing type, water storage method and source of information influenced KAP levels. Therefore, dengue prevention among urban households requires behaviour-oriented education, regular household source reduction and stronger municipal community coordination.

REFERENCES

- [1] World Health Organization. Dengue and severe dengue [Internet]. Geneva: WHO; 2025 [cited 2026 May 26]. Available from: <https://www.who.int/news-room/factsheets/detail/dengue-and-severe-dengue>
- [2] Centers for Disease Control and Prevention. Dengue [Internet]. Atlanta: CDC; 2024 [cited 2026 May 26]. Available from: <https://www.cdc.gov/dengue/>
- [3] National Center for Vector Borne Diseases Control. Dengue [Internet]. New Delhi: Ministry of Health and Family Welfare, Government of India; 2026 [cited 2026 May 26]. Available from: <https://ncvbdc.mohfw.gov.in/>
- [4] National Center for Vector Borne Diseases Control. National guidelines for clinical management of dengue fever 2023. New Delhi: Ministry of Health and Family Welfare, Government of India; 2023.
- [5] World Health Organization. Dengue guidelines for diagnosis, treatment, prevention and control. Geneva: WHO; 2009.
- [6] Bhatt S, Gething PW, Brady OJ, Messina JP, Farlow AW, Moyes CL, et al. The global distribution and burden of dengue. *Nature*. 2013;496(7446):504-507.
- [7] Ahmed AE, et al. Knowledge, attitudes, and practices of the population in a dengue endemic region. *Int J Environ Res Public Health*. 2022;19:1-12.
- [8] National Vector Borne Disease Control Programme. Strategy for effective community participation for prevention and control of dengue. New Delhi: Directorate General of Health Services; 2010.
- [9] Gupta P, Kumar P, Aggarwal OP. Knowledge, attitude and practices related to dengue in rural and slum areas of Delhi. *Indian J Community Med*. 1998;23:1-5.
- [10] Chandani S, et al. Knowledge, attitude and practices related to dengue among population in Maharashtra, India: a cross-sectional online survey. *Discover Public Health*. 2026.
- [11] Mondal R, et al. A cross-sectional study on knowledge, attitude and practice and risk factors on dengue fever among children in Eastern India. *J Compr Health*. 2023;11:1-8.
- [12] Rakhmani AN, et al. Knowledge, attitudes and practices regarding dengue prevention behavior among health volunteers. *J Prev Med Public Health*. 2024;57:1-10.



- [13] Chandrasena N, et al. An overview of dengue knowledge, attitudes and practices among the general public: a review and meta-analysis. *Trop Med Infect Dis.* 2025;10:189.
- [14] World Mosquito Program. Dengue: symptoms, treatment and prevention [Internet]. Melbourne: World Mosquito Program; 2025 [cited 2026 May 26]. Available from: <https://www.worldmosquitoprogram.org/>
- [15] European Centre for Disease Prevention and Control. Factsheet for health professionals about dengue [Internet]. Stockholm: ECDC; 2023 [cited 2026 May 26]. Available from: <https://www.ecdc.europa.eu/en/dengue-fever/facts>