

Knowledge, Attitudes and Practices towards Dengue Fever among Attendants of Dengue Fever Patients Admitted at Jinnah Hospital Lahore, Pakistan

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ABSTRACT

Background: Dengue fever has a variable clinical presentation and course and causes a significant burden in endemic communities. Understanding people's knowledge, attitudes and practices (KAP) is essential for monitoring transmission and planning control measures. This study assessed the KAP regarding dengue fever among caregivers of patients admitted with dengue fever at Jinnah Hospital, Lahore.

Methods: This cross-sectional study was conducted at the Department of Medicine, Unit-III, Jinnah Hospital, Lahore, from January to June 2025. Seventy-three caregivers were enrolled and completed a structured questionnaire assessing knowledge (8 items, score range: 0–8), attitude (8 items, score range: 0–16), and practices (6 items, score range: 0–6). Data were analysed in IBM SPSS version 27. Categorical data were presented as frequencies and percentages, and continuous scores as mean $\pm$ standard deviation. Independent-samples t-tests were used to compare scores across age, gender, and educational status, with $p < 0.05$ considered significant.

Results: Knowledge was generally poor (mean 3.14 ± 1.33 ; 89.0% poor, and 11.0% moderate). Only 27.4% knew dengue spread through mosquito bites, while 47.9% identified the Aedes mosquito as a dengue virus vector. Among them, only 21.9% were aware of the dengue vaccine. Attitudes were also poor (mean 5.78 ± 2.17 ; 78.1% poor, 21.9% moderate, 0% positive); favourable responses were a minority on every attitude item. Practice scores were modest (mean 3.25 ± 1.23). Knowledge and practice scores were significantly higher among literate participants ($p < 0.001$), whereas age, gender and all attitude comparisons showed no significant differences.

Conclusion: Caregivers demonstrated poor knowledge, poor preventive attitudes, and suboptimal practices regarding dengue. Educational status was the only factor significantly associated with knowledge and practice. Community-based awareness campaigns and targeted health education are needed.

Keywords: Dengue fever; Dengue virus; Knowledge; Attitudes; Practices.

INTRODUCTION

Dengue outbreaks have increased in recent years, driven largely by rapid, unplanned population growth and inadequate waste management that creates conditions for mosquito breeding and spread. Millions of dengue cases occur annually, and about 2.5 billion people live in dengue-endemic countries. Asia, the Americas, Africa and the Caribbean are the regions where dengue has become

a major public-health problem because of its rapid spread.^{1–3}

Dengue has a variable clinical presentation and course, and the outcome can be life-threatening; therefore, early diagnosis is important. In 2009, the World Health Organization, in coordination with a working group, established guidelines for the clinical management of dengue.^{4,5} Public awareness of preventive measures is central to control. These measures include eliminating mosquito breeding sites, disposing of stagnant water, wearing protective clothing, using mosquito repellents, and spraying houses to control mosquito populations.⁶ The response of the general public towards dengue prevention and management plays a vital role in reducing the associated morbidity and mortality.⁷

If dengue is not diagnosed in time it can progress rapidly to dengue haemorrhagic fever and dengue shock syndrome. The unnecessary administration of intravenous fluids by general practitioners remains a common problem.⁸ When people follow medical advice on the proper use of oral rehydration fluids, timely complete blood count (CBC) monitoring and recognition of warning signs

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such as abdominal pain, nausea, vomiting, cold peripheries, decreased urine output, dizziness and narrow pulse pressure, severe complications can be reduced.⁹

Understanding the community's knowledge, attitudes and practices regarding dengue is essential for planning effective prevention and control strategies.¹⁰ This study therefore assessed the level of awareness about dengue fever and the response of caregivers of admitted dengue patients towards preventive measures and medical advice at Jinnah Hospital, Lahore.

PARTICIPANTS AND METHODS

This cross-sectional study was conducted at Medical Unit-III of Jinnah Hospital, Lahore, from January to June 2025. The study was reviewed and approved by the Ethical Review Board of Allama Iqbal Medical College, Lahore, Pakistan (Ref No ERB 131/4/10-11-2022/S1). Participants were recruited after written informed consent.

A total of 73 caregivers of patients admitted to Medical Unit-III were selected through non-probability consecutive sampling. Caregivers were aged 20–50 years, of either gender, and one caregiver was recruited per dengue-positive patient. A structured, pre-tested questionnaire was administered to assess knowledge, attitude and practices. A pilot study with 30 respondents was conducted to assess comprehension, clarity and completion time, and the questionnaire was revised accordingly.

The final questionnaire comprised 8 knowledge items, 8 attitude items and 6 practice items, in addition to demographic items (age, gender and education level). It was originally developed in English and then translated into Urdu and Punjabi. Trained research assistants (house officers) administered it through face-to-face interviews. Literate participants could read and respond independently, with assistance if needed; for illiterate participants, research assistants read the items aloud in the participant's preferred language (Urdu or Punjabi) using simple, non-medical terminology. Therapeutic misconception was addressed: participants were clearly informed that the survey was for research purposes only and that their responses would not influence their patient's treatment.

Internal consistency was assessed using Cronbach's alpha (0.80); a value ≥ 0.70 was considered acceptable.

Knowledge was scored 1 for each correct response and 0 for an incorrect or "don't know" response, giving a total of 0–8, categorised as poor (0–4), moderate (5–6) and good (7–8). Practice was scored 1 for each positive practice and 0 otherwise (total 0–6), categorised as poor (0–2), moderate (3–4) and good (5–6). The knowledge and practice scales were adapted from previous KAP studies.¹¹

Attitude was assessed using an eight-item scale adapted from previously published KAP studies on dengue prevention.¹² Each statement was rated on a three-point Likert scale (agree = 2, neutral = 1, disagree = 0). The two negatively worded items were reverse-coded before analysis. The total attitude score ranged from 0 to 16, with higher scores indicating a more positive attitude; scores were categorised as poor (<50%; 0–7), moderate (50–75%; 8–12) and positive (>75%; 13–16).

Data were entered and analysed using IBM SPSS version 27. Categorical variables were presented as frequencies and percentages, and continuous scores as mean $\pm$ standard deviation. Independent-samples t-tests compared mean knowledge, attitude and practice scores across age, gender and educational categories after assessing normality. The chi-square test examined associations between categorical variables. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 73 participants were included. Of these, 23 (31.5%) were younger than 25 years, 45 (61.6%) were male, and 40 (54.8%) were literate (Table 1). Knowledge of dengue was generally poor (Table 2). Only 20 (27.4%) participants knew that dengue spread by mosquito bites,

Table 1: Demographic characteristics of respondents (n = 73)

Characteristic	Frequency, n (%)
Age	
<25 years	23 (31.5)
≥ 25 years	50 (68.5)
Gender	
Male	45 (61.6)
Female	28 (38.4)
Education	
Illiterate	33 (45.2)
Literate	40 (54.8)

Table 2: Knowledge regarding dengue fever among respondents (n = 73)

Knowledge item	Yes, n (%)	No, n (%)
Dengue is spread through mosquito bites	20 (27.4)	53 (72.6)
Aedes mosquito is responsible for transmission	35 (47.9)	38 (52.1)
Aware of the dengue vaccine	16 (21.9)	57 (78.1)
Aware of the warning signs of dengue	32 (43.8)	41 (56.2)
Pain behind the eyes, fever, joint pain and nausea are symptoms of dengue	33 (45.2)	40 (54.8)
Dengue can occur with mild or no symptoms	29 (39.7)	44 (60.3)
Mosquito breeding sites should be inspected routinely	33 (45.2)	40 (54.8)
Intravenous fluids are the first-line treatment for dengue *	42 (57.5)	31 (42.5)

*Reverse item: the knowledge-correct response is "No." Intravenous fluids are not the first-line treatment for dengue.

while 35 (47.9%) correctly identified the *Aedes* mosquito as the vector. Awareness of the dengue vaccine was low, reported by only 16 (21.9%) participants. Awareness of warning signs (nausea, vomiting, abdominal pain, decreased urine output, dizziness and cold peripheries) was reported by 32 (43.8%) participants, and 33 (45.2%) recognised pain behind the eyes, high-grade fever, joint pain, muscle pain and nausea as symptoms of dengue. Twenty-nine (39.7%) knew that dengue can occur with mild or no symptoms, and 33 (45.2%) believed that breeding sites should be inspected routinely. Notably, 42 (57.5%) incorrectly believed that intravenous fluid therapy is the first-line treatment for dengue.

Attitudes towards dengue prevention were also poor (Table 3). Favourable responses were a minority on every item: only 20.5% agreed that preventing mosquito breeding is everyone's responsibility, 27.4% were willing to participate in community prevention activities, and 12.3% agreed that suspected dengue warrants prompt medical care. On the two reverse-worded items, 45.2% agreed (or were neutral) that cleaning breeding sites is pointless, and a similar proportion endorsed the idea that home remedies remove the need for medical evaluation.

With regard to preventive practices, 32 (43.8%) reported spraying their houses with pesticides, 57 (78.1%) cleaned stagnant water regularly, 51 (69.9%) wore covered clothing during peak biting hours, and 30 (41.1%) used mosquito repellent lotion (Table 4). Twenty-six (35.6%) followed physicians' instructions regarding ORS intake, and 46 (63.0%) obtained daily CBC monitoring as advised.

The overall mean knowledge score was 3.14 ± 1.33 ; 65 (89.0%) participants had poor knowledge, 8 (11.0%) moderate, and none reached the good category. The overall mean attitude score was 5.78 ± 2.17 ; 57 (78.1%) participants had a poor attitude, 16 (21.9%) a moderate attitude, and none reached a positive attitude. The overall mean practice score was 3.25 ± 1.23 , with 17 (23.3%) poor, 48 (65.8%) moderate and 8 (11.0%) good (Table 5).

Knowledge scores did not differ significantly by age (3.09 ± 1.28 vs 3.16 ± 1.36 ; $p = 0.824$) or gender (3.16 ± 1.40 vs 3.11 ± 1.23 ; $p = 0.877$), but literate participants scored significantly higher than illiterate participants (3.95 ± 0.88 vs 2.15 ± 1.09 ; $p < 0.001$).

Table 3: Attitudes regarding dengue prevention and management (n = 73)

Attitude item	Positive n (%)	Neutral n (%)	Negative n (%)
Preventing mosquito breeding is everyone's responsibility	15 (20.5)	15 (20.5)	43 (58.9)
It is important to inspect my home and surroundings regularly for mosquito breeding sites	21 (28.8)	18 (24.7)	34 (46.6)
I am willing to participate in community activities to prevent dengue	20 (27.4)	17 (23.3)	36 (49.3)
Using mosquito-prevention measures (repellents, bed nets, protective clothing) is worthwhile	12 (16.4)	23 (31.5)	38 (52.1)
People with suspected dengue should seek medical care promptly	9 (12.3)	18 (24.7)	46 (63.0)
Dengue is a serious disease that can be prevented through proper preventive measures	16 (21.9)	22 (30.1)	35 (47.9)
Cleaning mosquito breeding sites is unnecessary because dengue cannot be prevented †	25 (34.2)	15 (20.5)	33 (45.2)
Home remedies are sufficient; people with dengue do not need medical evaluation †	23 (31.5)	12 (16.4)	38 (52.1)

Three-point Likert scale (agree = 2, neutral = 1, disagree = 0).

Positive = favourable response; negative = unfavourable response.

† Negatively worded item, reverse-coded before analysis (the favourable response is "disagree").

Table 4: Practices regarding dengue prevention and control (n = 73)

Practice item	Yes n (%)	No n (%)
House sprayed against mosquitoes	32 (43.8)	41 (56.2)
Cleans stagnant water daily	57 (78.1)	16 (21.9)
Wears covered clothes during mosquito-biting hours	51 (69.9)	22 (30.1)
Uses mosquito repellent lotion	30 (41.1)	43 (58.9)
Follows ORS instructions advised by the doctor	26 (35.6)	47 (64.4)
Gets CBC done daily as advised by the doctor	46 (63.0)	27 (37.0)

Table 5: Distribution of knowledge, attitude and practice scores (n = 73)

Variable	Mean $\pm$ SD	Median	Poor n (%)	Moderate n (%)	Good/Positive n (%)
Knowledge (0–8) *	3.14 ± 1.33	3	65 (89.0)	8 (11.0)	0 (0.0)
Attitude (0–16) †	5.78 ± 2.17	6	57 (78.1)	16 (21.9)	0 (0.0)
Practice (0–6) ‡	3.25 ± 1.23	3	17 (23.3)	48 (65.8)	8 (11.0)

*Knowledge: poor 0–4, moderate 5–6, good 7–8.

† Attitude: poor 0–7, moderate 8–12, positive 13–16.

‡ Practice: poor 0–2, moderate 3–4, good 5–6.

Table 6: Comparison of knowledge, attitude and practice scores by demographic characteristics (n = 73)

Characteristics	Knowledge Mean ± SD	p-value	Attitude Mean ± SD	p-value	Practice Mean ± SD	p-value
Age						
<25 years (n=23)	3.09 ± 1.28	0.824	5.91 ± 2.25	0.731	3.17 ± 1.27	0.737
≥25 years (n=50)	3.16 ± 1.36		5.72 ± 2.16		3.28 ± 1.23	
Gender						
Male (n=45)	3.16 ± 1.40	0.877	6.00 ± 2.12	0.281	3.31 ± 1.16	0.586
Female (n=28)	3.11 ± 1.23		5.43 ± 2.25		3.14 ± 1.35	
Education						
Illiterate (n=33)	2.15 ± 1.09	<0.001	5.70 ± 2.04	0.764	2.61 ± 1.22	<0.001
Literate (n=40)	3.95 ± 0.88		5.85 ± 2.30		3.77 ± 0.97	

Independent-samples t-test; p < 0.05 considered statistically significant. Knowledge range 0–8, attitude range 0–16, practice range 0–6.

Attitude scores showed no significant differences across age, gender or education (all p > 0.05). Practice scores were also independent of age and gender but were significantly higher among literate participants (3.77 $\pm$ 0.97 vs 2.61 $\pm$ 1.22; p < 0.001) (Table 6). Overall, knowledge and practice were significantly associated with educational status, whereas age, gender and attitude showed no significant associations.

DISCUSSION

Dengue remains one of the most devastating mosquito-borne illnesses worldwide.^{13,14} Knowledge of the dengue vector and appropriate human behaviour are crucial for preventing transmission.¹⁵ In this caregiver population, knowledge, attitudes and practices were all poor, and educational status emerged as the only factor significantly associated with knowledge and practice scores.

Our findings are consistent with regional evidence. In Pakistan, dengue continues to expand as a public-health menace, yet community awareness has lagged behind the rising disease burden.⁵ Across South Asia, comparably low awareness has been documented among slum dwellers in Dhaka, Bangladesh,¹⁵ in slum and slum-like pockets of Delhi, India,⁶ and among community members in central Nepal.¹⁶ Studies from other dengue-endemic settings such as Aceh, Indonesia,¹² dengue hotspots in Malaysia,¹¹ and outbreak-affected populations in Vietnam¹⁷ likewise report important gaps between knowledge and preventive practice, although attitude scores in several of these settings were more favourable than in our sample. The comparatively poorer attitudes we observed may reflect the lower educational profile and acute hospital setting of our participants.

Awareness of dengue vaccination was particularly low, with only 21.9% of caregivers aware that a vaccine exists. This mirrors the limited vaccine literacy reported in several endemic countries and highlights a clear target for health-education messaging, especially as licensed dengue vaccines become more widely discussed in the region.

Knowledge of warning signs was also limited; fewer than half of participants could identify the danger signs

that should prompt urgent care. Because timely recognition of warning signs is central to preventing progression to severe dengue, this gap has direct clinical consequences and should be prioritised in caregiver education during and after hospitalisation.

Misconceptions about dengue management were common. More than half of caregivers wrongly believed that intravenous fluids are the first-line treatment for dengue, and a substantial proportion endorsed the view that home remedies are sufficient and that medical evaluation is unnecessary. Such misconceptions can delay appropriate care and encourage inappropriate fluid use, both of which are associated with worse outcomes.⁸ Correcting these beliefs through clear, simple messaging is essential.

Education was the strongest determinant of both knowledge and practice in our study, with literate participants scoring significantly higher in both domains (p < 0.001). This is consistent with the wider KAP literature, in which higher educational attainment repeatedly predicts better dengue knowledge and preventive behaviour.^{15,16} It suggests that health-education interventions should be designed for low-literacy audiences, using pictorial and verbal materials in local languages, and that community campaigns should specifically reach less-educated and disadvantaged groups.¹⁸

Taken together, these findings indicate that if appropriate awareness is provided, the burden of dengue can be reduced. Community-wide interventions — regular insecticide spraying and elimination of stagnant-water sources — should accompany individual behaviour change to reduce mosquito breeding. Our study adds to the existing literature on mosquito-borne diseases and underscores the value of a multifaceted prevention approach.

This study has several limitations. It was a single-centre study conducted at one tertiary hospital, which limits the generalisability of the findings. The sample size was small (n = 73), and participants were recruited through non-probability consecutive sampling, which may introduce selection bias. Because some items relied on participant recall of past behaviour, recall bias is possible.

The face-to-face interview format may have introduced social-desirability bias, with participants over-reporting favourable practices. Finally, we collected only age, gender and education, and did not capture socioeconomic status, occupation, household income or previous dengue exposure, all of which may influence knowledge, attitudes and practices.

CONCLUSIONS

Caregivers of hospitalised dengue patients demonstrated poor knowledge, poor preventive attitudes and suboptimal practices regarding dengue fever. Educational status was significantly associated with both knowledge and practice scores, whereas age and gender were not. These findings highlight the need for community-based awareness campaigns and targeted, low-literacy health-education interventions — focused on vector control, early warning signs and correct dengue management — to improve dengue prevention in this population.

Author Contributions

SNK: Conception and design, analysis and interpretation of data, drafting the article, critical revision for important intellectual content, final approval.

AU: Conception and design, analysis and interpretation of data.

HAK: Analysis and interpretation of data, drafting the article.

AG: Acquisition of data, conception and design, analysis and interpretation.

AH: Conception and design, analysis and interpretation of data.

SMH: Conception and design, analysis and interpretation of data.

REFERENCES

1. Tayal A, Kabra SK, Lodha R. Management of dengue: an updated review. *Indian J Pediatr.* 2023;90(2):168-77.
2. Telle O, Nikolay B, Kumar V, Benkimoun S, Pal R, Nagpal BN, et al. Social and environmental risk factors for dengue in Delhi city: a retrospective study. *PLoS Negl Trop Dis.* 2021;15(2):e0009024.
3. Wang WH, Urbina AN, Chang MR, Assavalapsakul W, Lu PL, Chen YH, et al. Dengue hemorrhagic fever: a systematic literature review of current perspectives on pathogenesis, prevention and control. *J Microbiol Immunol Infect.* 2020;53(6):963-78.
4. Kularatne SA, Dalugama C. Dengue infection: global importance, immunopathology and management. *Clin Med (Lond).* 2022;22(1):9-13.
5. Parveen S, Riaz Z, Saeed S, Ishaque U, Sultana M, Faiz Z, et al. Dengue hemorrhagic fever: a growing global menace. *J Water Health.* 2023;21(11):1632-50.
6. Kusuma YS, Goswami AK, Babu BV. Dengue awareness, preventive behaviours and Aedes breeding opportunities among slums and slum-like pockets in Delhi, India: a formative assessment. *Trans R Soc Trop Med Hyg.* 2021;115(6):653-63.
7. Chng JW, Parvathi T, Pang J. Knowledge, attitudes and practices of dengue prevention between dengue sustained hotspots and non-sustained hotspots in Singapore: a cross-sectional study. *Sci Rep.* 2022;12(1):18426.
8. Salahuddin M, Khalid R, Hanif S, Naeem F, Aijaz R, Ali AS. Excessive fluid resuscitation is associated with intensive care unit mortality in Pakistani patients with dengue shock syndrome. *Acute Crit Care.* 2025;40(2):235-43.
9. Mponzi WP, Swai JK, Kaindoa EW, Kifungo K, Eiras AE, Batista EP, et al. Observing the distribution of mosquito bites on humans to inform personal protection measures against malaria and dengue vectors. *PLoS One.* 2022;17(7):e0271833.
10. Iovinella I, Caputo B, Cobre P, Manica M, Mandoli A, Dani FR. Advances in mosquito repellents: effectiveness of citronellal derivatives in laboratory and field trials. *Pest Manag Sci.* 2022;78(12):5106-12.
11. Selvarajoo S, Liew JWK, Tan W, Refai WF, Ahmad Zaki R, Sethi N, et al. Knowledge, attitude and practice on dengue prevention and dengue seroprevalence in a dengue hotspot in Malaysia: a cross-sectional study. *Sci Rep.* 2020;10:9534.
12. Harapan H, Rajamoorthy Y, Anwar S, Bustamam A, Radiansyah A, Angraini P, et al. Knowledge, attitude, and practice regarding dengue virus infection among inhabitants of Aceh, Indonesia: a cross-sectional study. *BMC Infect Dis.* 2018;18(1):96.
13. Tsheten T, Clements AC, Gray DJ, Adhikary RK, Furuya-Kanamori L, Wangdi K. Clinical predictors of severe dengue: a systematic review and meta-analysis. *Infect Dis Poverty.* 2021;10(1):123.
14. Madanayake PM, Jayawardena AE, Wijekoon SL, Perera N, Wanigasuriya JK. Fluid requirement in adult dengue haemorrhagic fever patients during the critical phase of the illness: an observational study. *BMC Infect Dis.* 2021;21(1):286.
15. Rahman MM, Tanni KN, Roy T, Islam MR, Rumi MA, Sakib MS, et al. Knowledge, attitude and practices towards dengue fever among slum dwellers: a case study in Dhaka City, Bangladesh. *Int J Public Health.* 2023;68:1605364.
16. Phuyal P, Kramer IM, Kuch U, Magdeburg A, Groneberg DA, Lamichhane Dhimal M, et al. The knowledge, attitude and practice of community people on dengue fever in Central Nepal: a cross-sectional study. *BMC Infect Dis.* 2022;22(1):454.
17. Nguyen HV, Than PQ, Nguyen TH, Vu GT, Hoang CL, Tran TT, et al. Knowledge, attitude and practice about dengue fever among patients experiencing the 2017 outbreak in Vietnam. *Int J Environ Res Public Health.* 2019;16(6):976.
18. Launiala A. How much can a KAP survey tell us about people's knowledge, attitudes and practices? Some observations from medical anthropology research on malaria in pregnancy in Malawi. *Anthropol Matters.* 2009;11(1).