

Knowledge, Attitude, and Practice Regarding Dengue Virus Infection among Inhabitants of Chakwal, Pakistan: A Cross-Sectional Study

 Muhammad Asjad Khan^{1*}
 Arooba²
 Maham Zafar³
 Fizza Shahid⁴

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Abstract

Dengue fever is a problem in many places, including Pakistan. It is a disease that mosquitoes spread. This study aimed to check the knowledge, attitude and practices of people in Chakwal Pakistan about dengue fever. 400 people in Chakwal from cities and rural areas were assessed. Data was collected with a questionnaire with demographic information and KAP related to dengue. Many of them knew a lot about dengue fever. Almost 63 percent people knew that dengue fever is a viral disease and 63 percent knew that Aedes mosquitoes spread it. They also knew that mosquitoes breed in water and that we can prevent dengue fever by covering water containers using insecticide sprays and mosquito nets. Most people thought that dengue fever is a disease and that we can prevent it. They did things like removing waste preventing water from stagnating and covering water containers. This study shows that people in Chakwal generally know about dengue fever and try to prevent it. There are still some big gaps, in what they know and some wrong ideas. So, it is essential to keep teaching people about dengue fever and to get the community involved in preventing it. This way we can reduce the number of people who get dengue fever in Chakwal.

Keywords: Chakwal, Dengue Fever, breakbone fever, aedes mosquitoes, health problem

1 Introduction

Dengue fever, also known as breakbone fever is a sickness that mosquitoes spread. It is caused by a virus which belong to Flaviviridae family. The infection mainly spreads through bites from

¹Department of Biological Sciences, Faculty of Science and Technology, Virtual University of Pakistan, Raiwind Road Campus, Lahore, Pakistan

Correspondence author: asjad.khan@vu.edu.pk

²Department of Microbiology, Doctors Hospital and Medical Center, Lahore Pakistan

³Department of Cardiology, University of Health Sciences, Lahore, Pakistan

⁴Allied Burn and Reconstructive Surgery Centre, Allied Hospital, Faisalabad, Pakistan



Aedes aegypti and *Aedes albopictus* mosquitoes. Dengue fever is a health problem in tropical and subtropical areas all around the world (Schaefer et al., 2024). The virus has four serotypes (DENV-1 to DENV-4), and while infection with one serotype provides lifelong immunity to that type, secondary infections with other serotypes can increase the risk of severe disease, including dengue hemorrhagic fever (DHF) (Balwan et al., 2022). Dengue is endemic in over 100 countries, particularly in Southeast Asia, Latin America, and the Pacific Islands, with an estimated 390 million cases reported annually (Tian et al., 2022). It can spread due to the factors such as urbanization, climate change, and inadequate vector control. Symptoms of dengue are high fever, headache, and joint pain. In severe cases it leads to plasma leakage, bleeding, and organ damage (Sarker et al., 2024). Prevention measures include the elimination of mosquito breeding sites, use of insect repellents, and community involvement (Zohra et al., 2024). Although vaccines like Dengvaxia and TAK-003 have been introduced in endemic regions, their use is limited by age and prior infection status, and they offer only partial protection (Ranzani et al., 2026). Serological tests like (IgM/IgG ELISA), molecular methods (RT-PCR), and clinical indicators such as thrombocytopenia can be used for diagnosis (Khan et al., 2022; Pillay et al., 2025). Knowledge, Attitudes, and Practices (KAP) studies can help public understanding and behaviors toward prevention which can make community aware and play an important role in dengue control (Samsudin et al., 2024). Strengthening community participation and improving health education can enhance the effectiveness of dengue prevention and control strategies, ultimately reducing disease transmission and impact (Samsudin et al., 2024).

2 Research Methodology

2.1 Study Design

A cross-sectional descriptive study was employed to analyze the residents of Chakwal's knowledge, attitude, and practices about dengue virus infection prevention (Mohamed et al., 2025).

2.2 Study Setting

The study was taken place in households, schools, colleges, and universities, as well as in local or rural regions such as villages in Pakistan's Chakwal city (Amirudin et al., 2021).

2.3 Inclusion Criteria

Targeted primary population was Chakwal's rural and urban adult people (aged 16 to above 45) (Iftikhar et al., 2024).

2.4 Sample Size Determination

The sample size is computed using the proportion of a single population formula. Because no historical data are available, the sample size is set using a 95% confidence level, a 50% margin of error bar, and assumed 50% dengue virus infection awareness prevalence. To account for the 10% non-response rate, the final sample size is adjusted.

2.5 Sampling Method

Data will be collected from residents of Chakwal city and related rural areas using pre-designed

questionnaire survey forms. The survey questionnaire was designed to inform the people of Chakwal city about dengue virus infection and to make them aware of its signs and symptoms and what measures should be taken to avoid them.

The KAP Dengue survey has four sections

1. The first section deals with socio-economic data (characteristics).
2. The second section deals with knowledge
3. The third section deals with attitude.
4. The fourth section is about good practice (Sivanandy et al., [2022](#)).

2.6 Data Collection

Close-ended questionnaires are used to collect data. The questionnaire is based on a thorough literature analysis and includes a wide range of questions about knowledge, attitudes, and practices addressing dengue virus infection. Content validity and reliability of surveys are pre-tested (Zhang et al., 2025).

2.7 Ethical Implications

The research protocol will be submitted for ethical approval to the Pakistan Virtual University Institutional Review Board (IRB). All study participants provided informed consent. Throughout the study, participants’ confidentiality and identities will be preserved (Amirudin et al., [2021](#)).

2.8 Data Analysis

Data is entered into a statistical software tool for analysis. To summarize the demographics of the participants, descriptive statistics are utilized. Knowledge, attitudes, and practice values are calculated, and the correlations between variables are investigated using relevant statistical tests (chi-square test, t-test, and so on). A statistically significant p-value is less than 0.05 (Iftikhar et al., [2024](#)).

3 Results

Out of 400 respondents, 203 (50.6%) were males and 196 (48.9%) females. Mean age was from under 16 to above 45. Overall, both males and females showed better or positive response regarding dengue survey. The KAP survey results have been presented in the tables or graphs provided below

Table 1: Socioeconomic Data

Sr. #	Statements	Frequency	Percentage %
No of participants	Male/Female	400	100%
Gender of participants	Male	203	50.6%
	Female	196	48.9%
	Prefer not to say	1	.2%
Age Group	16 – 25	323	80.5%
	26 – 35	29	7.2%
	36 – 45	35	8.7%
	Above 45	13	3.2%
Education	Diploma	30	7.5%
	Graduate	199	49.6%
	High School	24	6.0%
	Illiterate	16	4.0%
	Intermediate	53	13.2%
	Middle School	69	17.2%

Marital Status	Primary School	9	2.2%
	Married	74	18.5%
	Unmarried	321	80.0%
Resident Area	Widow	5	1.2%
	Rural	161	40.1%
Occupation	Urban	239	59.6%
	Businessperson	18	4.5%
	Employed	31	7.7%
	Farmer	2	.5%
	Housewife	4	1.0%
	Labor	7	1.7%
	Servant	21	5.2%
	Student	296	73.8%
	Unemployed	17	4.2%
	Vendor	4	1.0%

Table 2: Knowledge

Sr.	Statements	Yes	No	Not Sure
1	Is dengue caused by a virus?	251 (62.7%)	91 (22.7%)	59 (14.7%)
2	Do the Aedes mosquitoes transmit dengue virus?	252 (63.0%)	73 (18.2%)	76 (19.0%)
3	Do flies transmit dengue virus?	140 (35.0%)	224 (56.0%)	37 (9.2%)
4	Do ticks transmit dengue virus?	159 (39.7%)	164 (41.7%)	78 (19.5%)
5	Does casual person to person contact transmit Dengue fever?	169 (42.2%)	175 (43.7%)	56 (14.0%)
6	Is the dengue virus transmitted through food and water?	225 (56.2%)	134 (33.5%)	42 (10.5%)
7	Do mosquitoes breed in standing water?	270 (67.5%)	97 (24.2%)	34 (8.5%)
8	Do window screens and bed net reduce mosquitoes?	277 (69.2%)	83 (20.7%)	37 (9.2%)
9	Do insecticide sprays (such as Baygon) reduce mosquitoes and prevent Dengue fever?	279 (69.7%)	75 (18.7%)	47 (11.7%)
10	Do tightly covered water containers reduce mosquitoes?	296 (74.0%)	51 (12.7%)	54 (12.7%)
11	Do mosquito repellents prevent mosquito bites?	218 (54.5%)	103 (25.7%)	80 (20.0%)
12	Is dengue virus transmitted to humans by the bite of female Aedes mosquitoes that have been infected?	252 (63.0%)	74 (18.5%)	75 (18.7%)
13	Is the rainy season the only season when Dengue fever is present?	154 (38.5%)	179 (44.7%)	68 (17.0%)
14	Can you identify Aedes mosquitoes?	203 (50.7%)	136 (34.0%)	62 (15.5%)
15	Is headache a symptom of Dengue fever?	254 (63.5%)	80 (20.0%)	67 (16.7%)
16	Is joint pain a symptom of	249	66	84

	Dengue fever?	(62.2%)	(16.5%)	(21.0%)
17	Is muscle pain a symptom of Dengue fever?	217 (54.2%)	92 (23.0%)	92 (23.0%)
18	Is pain behind the eyes a symptom of Dengue fever?	212 (53.0%)	80 (20.0%)	72 (18.0%)
19	Is bone sore a symptom of Dengue fever?	156 (39.0%)	185 (46.2%)	59 (14.7%)
20	Are nausea/vomiting symptoms of Dengue fever?	217 (54.2%)	102 (25.5%)	82 (20.5%)
21	Is rash a symptom of Dengue fever?	206 (51.5%)	98 (24.5%)	97 (24.2%)
22	Is diarrhea common in Dengue fever?	166 (41.5%)	101 (25.2%)	132 (33.0%)
23	Is stomach pain common in Dengue fever?	183 (45.7%)	106 (26.5%)	112 (28.0%)
24	Is gum bleeding common in Dengue fever?	183 (45.7%)	124 (31.0%)	94 (23.5%)
25	Can a person suffer from Dengue fever more than once?	272 (68.0%)	73 (18.2%)	56 (14.0%)

Table 3: ATTITUDE

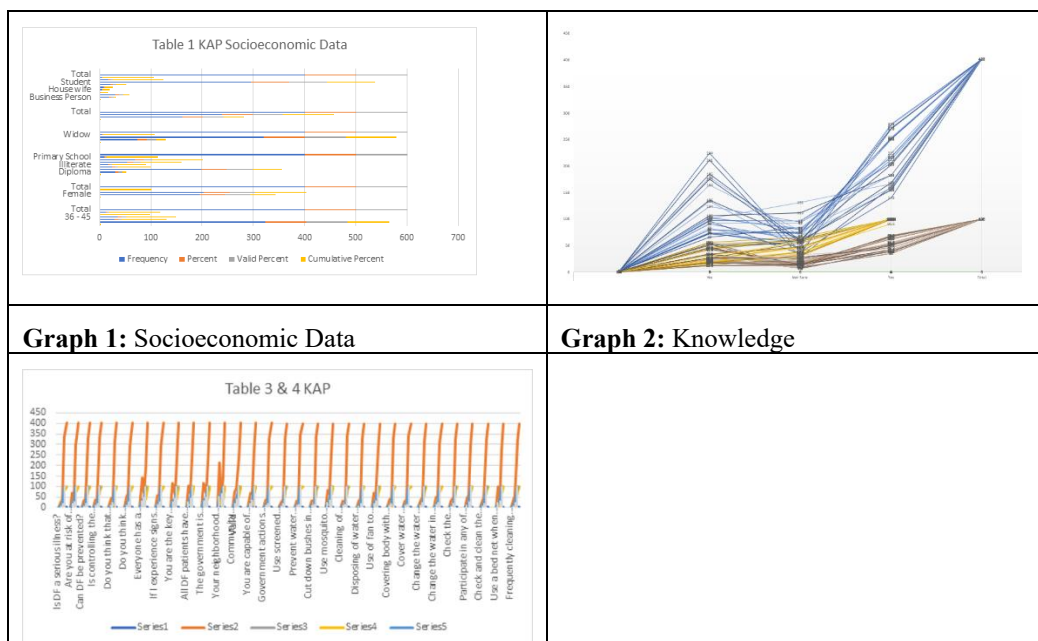
Sr.	Statement	Yes	No	Not Sure
1	Is DF a serious illness?	336 (84.0%)	25 (6.2%)	42 (10.5%)
2	Are you at risk of getting DF?	296 (74.0%)	68 (17.0%)	39 (9.7%)
3	Can DF be prevented?	330 (82.5%)	31 (7.7%)	42 (10.5%)
4	Is controlling the breeding places of mosquitoes a good strategy to prevent DF?	332 (83.0%)	36 (9.0%)	35 (8.7%)
5	Do you think that stagnant water around the house in discarded Tyres, broken pots and bottles is a breeding place of Aedes mosquitoes?	310 (77.5%)	46 (11.5%)	47 (11.7%)
6	Do you think communities should actively participate in controlling the vectors of DF?	288 (72.0%)	48 (12.0%)	67 (16.7%)
7	Everyone has a chance to suffer from DF.	191 (47.7%)	141 (32.2%)	71 (17.7%)
8	If I experience signs and symptoms of DF, I will immediately come to a Community Health Centre.	291 (72.7%)	56 (14.0%)	56 (14.0%)
9	You are the key individuals in preventing DF.	228 (57.0%)	115 (28.7%)	60 (15.0%)
10	All DF patients have the chance of a full recovery.	228 (57.0%)	105 (25.5%)	70 (17.5%)
11	The government is doing	213	118	71

	their best to prevent DF.	(53.2%)	(29.5%)	(17.7%)
12	Your neighborhood is a DF high-risk area.	136 (34.0%)	213 (53.2%)	54 (13.5%)
13	Community members are capable of preventing DF.	240 (60.0%)	72 (18.0%)	91 (22.7%)
14	You are capable of preventing DF.	268 (67.0%)	69 (17.2%)	66 (16.5%)
15	Government actions are needed for DF prevention.	327 (81.7%)	34 (8.5%)	42 (10.5%)

Table 4: Good Practice

Sr.	Statement	Yes	No	Not Sure
1	Use screened windows to reduce mosquitoes?	329 (82.2%)	29 (7.2%)	41 (10.2%)
2	Prevent water stagnation.	345 (86.2%)	33 (8.2%)	21 (5.2%)
3	Cut down bushes in the yard to reduce mosquitoes.	334 (83.5%)	32 (8.0%)	33 (8.2%)
4	Use mosquito eating fish to reduce mosquitoes.	250 (62.5%)	84 (21.0%)	66 (16.5%)
5	Cleaning of garbage/trash.	338 (84.5%)	33 (8.2%)	28 (7.0%)
6	Disposing of water holding containers such as tires, parts of automobiles, plastic bottles, and cracked pots.	329 (82.2%)	30 (7.5%)	40 (10.0%)
7	Use of fan to prevent mosquito biting.	282 (70.5%)	68 (17.0%)	49 (12.2%)
8	Covering your body with clothes when working in the bush, farm or forest.	326 (81.0%)	40 (10.0%)	33 (8.2%)
9	Cover water containers in the home.	339 (84.7%)	32 (8.0%)	28 (7.0%)
10	Change the water plant containers in the house every week.	313 (78.2%)	36 (9.0%)	50 (12.5%)
11	Change the water into flower containers.	302 (75.5%)	50 (12.5%)	47 (11.7%)
12	Check the waste/garbage that can block the flow of water around the home.	322 (80.5%)	30 (7.5%)	47 (11.7%)
13	Participate in any of the anti-dengue campaigns in the community.	295 (73.7%)	46 (11.5%)	58 (14.5%)
14	Check and clean the drains/gutters/roofs before the rainy season.	323 (80.7%)	27 (6.7%)	49 (12.2%)
15	Use a bed net when sleeping during the day.	272 (68.0%)	97 (24.2%)	30 (7.5%)

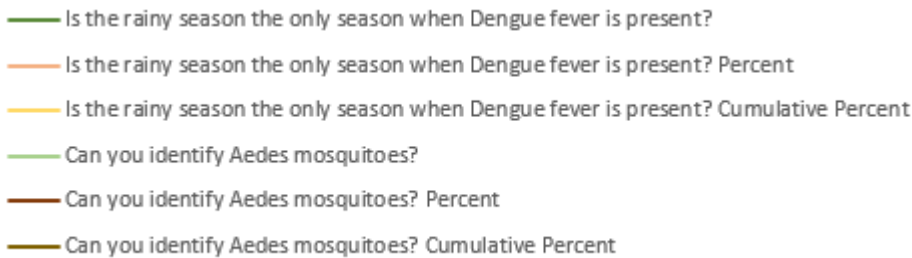
16	Frequently cleaning water filled containers and ditches around the house. More than once per week.	313 (78.2%)	30 (7.5%)	56 (14.0%)
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**Graph: 3&4**

- Is dengue virus transmitted through food and water? Valid Percent
- Do mosquitoes breed in standing water?
- Do mosquitoes breed in standing water? Frequency
- Do mosquitoes breed in standing water? Valid Percent
- Do window screens and bed net reduce mosquitoes?
- Do window screens and bed net reduce mosquitoes? Frequency
- Do window screens and bed net reduce mosquitoes? Valid Percent
- Do insecticide sprays (such as Baygon) reduce mosquitoes and prevent Dengue fever?
- Do insecticide sprays (such as Baygon) reduce mosquitoes and prevent Dengue fever? Frequency
- Do insecticide sprays (such as Baygon) reduce mosquitoes and prevent Dengue fever? Valid Percent
- Do tightly covered water containers reduce mosquitoes?
- Do tightly covered water containers reduce mosquitoes? Frequency
- Do tightly covered water containers reduce mosquitoes? Valid Percent
- Do mosquito repellents prevent mosquito bites?
- Do mosquito repellents prevent mosquito bites? Frequency
- Do mosquito repellents prevent mosquito bites? Valid Percent
- Is dengue virus transmitted to humans by the bite of female Aedes mosquitoes that have been infected?
- Is dengue virus transmitted to humans by the bite of female Aedes mosquitoes that have been infected? Frequency
- Is dengue virus transmitted to humans by the bite of female Aedes mosquitoes that have been infected? Valid Percent

- Is dengue is caused by a virus? Frequency
- Is dengue is caused by a virus? Valid Percent
- Can all mosquitoes transmit dengue virus?
- Can all mosquitoes transmit dengue virus? Frequency
- Can all mosquitoes transmit dengue virus? Valid Percent
- Do the Aedes mosquitoes transmit dengue virus?
- Do the Aedes mosquitoes transmit dengue virus? Frequency
- Do the Aedes mosquitoes transmit dengue virus? Valid Percent
- Do flies transmit dengue virus?
- Do flies transmit dengue virus? Frequency
- Do flies transmit dengue virus? Valid Percent
- Do ticks transmit dengue virus?
- Do ticks transmit dengue virus? Frequency
- Do ticks transmit dengue virus? Valid Percent
- Does casual person to person contact transmit Dengue fever?
- Does casual person to person contact transmit Dengue fever? Frequency
- Does casual person to person contact transmit Dengue fever? Valid Percent
- Is dengue virus transmitted through food and water?
- Is dengue virus transmitted through food and water? Frequency
- Is the rainy season the only season when Dengue fever is present?
- Is the rainy season the only season when Dengue fever is present? Frequency
- Is the rainy season the only season when Dengue fever is present? Valid Percent
- Can you identify Aedes mosquitoes?
- Can you identify Aedes mosquitoes? Frequency
- Can you identify Aedes mosquitoes? Valid Percent

- Is dengue is caused by a virus? Percent
- Is dengue is caused by a virus? Cumulative Percent
- Can all mosquitoes transmit dengue virus?
- Can all mosquitoes transmit dengue virus? Percent
- Can all mosquitoes transmit dengue virus? Cumulative Percent
- Do the Aedes mosquitoes transmit dengue virus?
- Do the Aedes mosquitoes transmit dengue virus? Percent
- Do the Aedes mosquitoes transmit dengue virus? Cumulative Percent
- Do flies transmit dengue virus?
- Do flies transmit dengue virus? Percent
- Do flies transmit dengue virus? Cumulative Percent
- Do ticks transmit dengue virus?
- Do ticks transmit dengue virus? Percent
- Do ticks transmit dengue virus? Cumulative Percent
- Does casual person to person contact transmit Dengue fever?
- Does casual person to person contact transmit Dengue fever? Percent
- Does casual person to person contact transmit Dengue fever? Cumulative Percent
- Is dengue virus transmitted through food and water?
- Is dengue virus transmitted through food and water? Percent
- Is dengue virus transmitted through food and water? Cumulative Percent
- Do mosquitoes breed in standing water?
- Do mosquitoes breed in standing water? Percent
- Do mosquitoes breed in standing water? Cumulative Percent
- Do window screens and bed net reduce mosquitoes?
- Do window screens and bed net reduce mosquitoes? Percent
- Do window screens and bed net reduce mosquitoes? Cumulative Percent
- Do insecticide sprays (such as Baygon) reduce mosquitoes and prevent Dengue fever?
- Do insecticide sprays (such as Baygon) reduce mosquitoes and prevent Dengue fever? Percent
- Do insecticide sprays (such as Baygon) reduce mosquitoes and prevent Dengue fever? Cumulative Percent
- Do tightly covered water containers reduce mosquitoes?
- Do tightly covered water containers reduce mosquitoes? Percent
- Do tightly covered water containers reduce mosquitoes? Cumulative Percent
- Do mosquito repellents prevent mosquito bites?
- Do mosquito repellents prevent mosquito bites? Percent
- Do mosquito repellents prevent mosquito bites? Cumulative Percent
- Is dengue virus transmitted to humans by the bite of female Aedes mosquitoes that have been infected?
- Is dengue virus transmitted to humans by the bite of female Aedes mosquitoes that have been infected? Percent
- Is dengue virus transmitted to humans by the bite of female Aedes mosquitoes that have been infected? Cumulative Percent



4 Discussion & Future Perspectives

Previous studies from countries such as Malaysia, India, Sri Lanka, Indonesia, China, and Bangladesh have consistently shown that limited public knowledge and awareness are key factors contributing to dengue outbreaks (Marinovic et al., [2023](#)). In Pakistan, public knowledge and attitude is improving by the campaigns and programs highlighting the importance of controlling the disease (Aslam et al., [2024](#)). In the present study which assessed the knowledge, attitudes and practices (KAP) in Chakwal residents revealed that most participants are unaware of the fact that mosquitoes are mainly responsible for transmission of this virus. Despite this, most demonstrated positive attitudes and adopted good preventive practices. The gap in knowledge is a result of insufficient health communication and limited public awareness initiatives (Mohamed et al., [2025](#)). Healthcare professionals should address this issue by prioritizing educational interventions on mosquito-borne transmission and highlighting the effective prevention strategies such as the use of insecticides, repellents, and bed nets. Educational institutions, including schools, colleges, and universities, can also play an important role in spreading awareness. Overall, the study emphasizes the need to strengthen health education and prevention efforts in Chakwal to reduce the risk of dengue transmission (Samsudin et al., [2024](#)). The study recommends that future efforts to improve knowledge, attitudes, and practices related to dengue control should focus on widespread awareness campaigns. These campaigns can be effectively delivered through social media platforms, television, and radio to reach a larger audience. In addition, educating people about dengue prevention in schools, colleges, universities, and workplaces can help reinforce key messages and promote long-term behavior change. Community-based education should include information on how dengue spreads, the role of mosquitoes in transmission, and practical steps to reduce breeding sites and protect against bites. Such educational efforts can empower individuals to take preventive actions in their homes and communities. The study also highlights the need for future research to assess the impact of these awareness strategies. Evaluating how well public health campaigns influence community knowledge and behavior in various regions of Pakistan will provide valuable insights for improving the design and delivery of dengue prevention programs.

4.1 Conclusion

The study emphasizes the urgent need to improve awareness and education about dengue virus infection in Chakwal, Pakistan. Although many residents lacked detailed knowledge about the disease, particularly regarding the role of mosquitoes in its transmission, they generally demonstrated a positive attitude and engaged in basic preventive practices. This indicates a strong potential for effective community engagement if proper information and guidance are provided. Educating people about the causes, symptoms, and prevention of dengue is essential for controlling its spread. The study recommends that health authorities and healthcare providers strengthen public education by developing targeted health promotion programs. These programs should focus on explaining how the dengue virus is transmitted, especially the role of Aedes mosquitoes, and on promoting practical prevention strategies such as eliminating standing water, using mosquito

repellents, and sleeping under bed nets. Furthermore, educational institutions, including schools, colleges, and universities, can play a key role in raising awareness and encouraging long-term behavioral change. By incorporating dengue education into academic settings and community outreach activities, these institutions can help reinforce important health messages and contribute to the overall reduction of dengue transmission in the region.

Author Contributions

Muhammad Asjad Khan, Arooba, Maham Zafar, and Fizza Shahid contributed to the conceptualization, research design, methodology, questionnaire development, participant recruitment, data collection, data curation, statistical analysis, interpretation of findings, and preparation of the manuscript. All authors contributed to writing—original draft and writing—review and editing. All authors read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Conflict of Interest

The authors declare that they have no financial, professional, institutional, or personal conflicts of interest that could have influenced the conduct, analysis, or reporting of this research.

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Data Availability

The de-identified data supporting the findings of this study may be obtained from the corresponding author upon reasonable request. The complete dataset is not publicly available because it contains information collected from human participants and is subject to confidentiality and data-protection requirements.

Use of Generative AI

The authors declare that no generative artificial intelligence tools were used to design the questionnaire, collect or analyse the data, generate the scholarly content, interpret the findings, or formulate the conclusions presented in this article.

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