

Knowledge, Attitude and Practice on Dengue among the Rural People of Sitakund in Chattogram

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ABSTRACT

Background: Dengue fever, the most prevalent mosquito-borne viral infection, is a recurrent public health threat in Bangladesh. Despite the government's efforts, dengue outbreaks are on the upswing and people's knowledge, belief and preventive practices regarding the disease at the rural community level are unclear. The objective of this study was to assess the level of knowledge, attitudes and preventive practices regarding dengue and associated factors among community people of rural Bangladesh.

Materials and methods: A cross-sectional survey was conducted involving 127 people using a convenient sampling technique from a village of Sitakunda Upazila of Chattogram, from June to August 2025. Participants responses were collected through face-to-face interviews using a pre-tested structured questionnaire that included information related to socio-demographics, dengue-related knowledge, attitude and preventive practices.

Results: Majority 54(42.2%) of respondents age ranged from 28-37 years, Females 68(53.54%) were predominant, 15(11.7%) were graduates, 79(61.7%) were service holders, 40(31.3%) had monthly income more than BDT 50,000, 60(46.9%) came from middle class family. All respondents knew that dengue fever is infectious and 125(98%) knew that untreated dengue fever may lead to death. 90(70.8%) respondents knowledge about dengue fever was good. 94(73.4%) believed that dengue prevention is every ones responsibility and all of them said they will accept dengue vaccine if provided. 100(78.7%) respondents attitude regarding dengue fever was positive. 27(21.1%) cleaned the mosquito breeding sites regularly and 38(29.9%) called the city corporation for fogging. Overall practice was not optimum. Only 51(40%) persons practice regarding prevention of dengue fever was satisfactory.

Conclusion: The findings of this study revealed a good level of knowledge and attitude regarding dengue among the respondents. Regarding dengue prevention the overall preventive practices were not satisfactory. This suggests that there is a need for extensive education to increase public awareness on dengue and encourage preventive practices in rural communities of Bangladesh.

Key words: Dengue fever; Mosquito borne disease; Rural people.

Introduction

Dengue cases are increasing dramatically worldwide, mostly in tropical countries like Bangladesh.^{1,2} Around 390 million dengue infections occur annually, of which a quarter will manifest clinically.¹ According to the World Health Organization, the number of dengue cases increased by 8-folds in last two decades, from 505,430 cases in 2000 to over 2.4 million in 2010 and 5.2 million in 2019.³ Though infection risks exists in 129 countries, 70% of the actual cases are seen in Asia.^{2,3} Dengue is a mosquito-borne viral infection which is caused by any one of the 4 serotypes (DENV-1, 2, 3 and 4) which may appear as a fatal disease characterized by dengue hemorrhagic fever and dengue shock syndrome.^{4,5} Dengue viruses are transmitted by female mosquitoes principally of the species *Aedes aegypti* and to a lesser extent, *Aedes albopictus*. Bangladesh has evolved into a major spot for the dengue vector and its transmission.⁶ The first dengue case was seen in Bangladesh in 1964.⁷ The sporadic cases and small outbreaks clinically suggest that the dengue

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occurred across the country from 1964 to 1999. But those were not officially reported.^{8,9} In 2000, a severe outbreak of dengue occurred in Bangladesh causing 93 mortality among 5551 morbidity cases.¹⁰ Dengue occurrences dropped dramatically in succeeding years, reaching a low of 375 cases in 2014. However, in 2016, around 6100 dengue cases have been reported in Bangladesh.¹¹ Three years later, in 2019, Bangladesh experienced the highest annual dengue incidence ever reported with 101,354 cases and 164 deaths.¹² Bangladesh reported 1405 dengue cases and only three confirmed dengue-related deaths in 2020.¹³ However this number has increased substantially with 28,429 dengue cases and 105 dengue-related deaths in 2021, which was even higher in 2022 with a total of 62,382 dengue cases and 281 dengue-related death. The 2022 outbreak is the second-largest outbreak since 2000.¹⁴ As of 30 May 2023, a total of 1927 dengue cases and 13 dengue related deaths were reported in Bangladesh.¹⁵ Dengue is often confused with other diseases due to the wide range of signs and symptoms and a lack of adequate case definitions.¹⁶ Therefore, it is highly probable that dengue cases may be substantially under-reported in Bangladesh due to weak surveillance of a healthcare system.¹⁷ Dengue fever is associated with number of factors like uncontrolled population expansion, urbanization and degradation in waste management systems and lack of effective vector control.^{18,19} Vector control is one of the most frequently applied methods of controlling or preventing dengue which can be done by frequent fogging in endemic areas which is mostly done outdoors.^{20,21} However, the *Aedes aegypti* mosquito tends to rest hidden indoors, making it hard for insecticide to reach adult mosquitoes.²² One of the few methods of dengue prevention is eliminating the breeding sites of dengue mosquitoes indoors and outdoors.²³ Human behavior is also an important contributor to creating breeding grounds for mosquitoes and sustaining mosquito populations.^{24,25} The success of efforts in dengue prevention and control is mainly from improving public and household environmental sanitation, water supply and alteration of human behavior towards dengue.²⁶ Furthermore, managing dengue outbreaks in tropical countries where temperatures remain favorable for mosquito breeding and viral replication around the year is a critical challenge.²⁷ Current vector-control in Bangladesh is a mandate of the local government engineering department. The city corporation or municipality is responsible for vector control activities including the elimination of breeding sites, larvicidal and adult mosquito control using different insecticides, for suppressing the mosquito vector activity at the

optimal time in annual population fluctuations, in order to achieve the lowest biting population, when environmental conditions for emergence and transmission are most favorable, especially during the peak dengue period (August-September).^{28,29} The city corporations also carried out mass awareness campaigns—through television and other mass media and alerted building owners including buildings under construction to prevent water collection. Fines have been imposed on buildings where the *Aedes* larvae have been found. Moreover, knowledge, beliefs and practices about dengue is evident to have an impact on dengue prevention and control.^{17,25,30} The Health Belief Model (HBM) is by far the most commonly used theory which comprises several main constructs: Perceived susceptibility, severity, benefits, barriers, self-efficacy to engage in a behavior and cues to action.³¹ In the context of dengue, the HBM provides a framework for understanding how to effectively structure messages and influence behavioral change.³² A Malaysian study found perceived barriers to perform dengue prevention, perceived susceptibility to dengue fever as significant factors associated to dengue prevention practices.³³ Several demographic and behavioral factors significantly influence knowledge and attitude and practice regarding dengue. A recent study in Bangladesh showed the level of education as an independent predictor for both knowledge and awareness of dengue.³⁴ Another Bangladeshi study found a significant relationship between the education level and the occupation with the practice to prevent and control dengue. Furthermore, successful participation largely depends on peoples' knowledge, awareness and attitude towards this disease.^{12,19} A previous study found that Bangladeshi people are well aware of dengue.³⁰ Inadequate knowledge about dengue is a major risk factor faced in the elimination of dengue but lacks accurate knowledge about signs and symptoms, the transmission of dengue and preventive practices can increase the spread of dengue fever among the Bangladeshi people.^{12,30} However, evidence was found that higher knowledge did not necessarily result in the adoption of the recommended preventive behavior.^{12,34} Therefore, further investigation is important to find effective preventive strategies as there is an ongoing challenge to ensure proper treatment and prevention options despite continued progress in dengue research throughout the world.^{35,36} Although several researchers investigated public knowledge, attitude and practice about dengue in Bangladesh but there is a lack of evidence from Bangladeshi rural communities.^{17,30,34} Therefore, the study aimed at investigating the level of knowledge, health beliefs and preventive practices

regarding dengue and also identified associated factors in relation to background characteristics and HBM among the rural community people of Bangladesh.

Materials and methods

This cross sectional study was done in a rural village of Sitakunda Upazila, Chattogram. 127 villagers were included in the study using purposive sampling method. A mixed type of questionnaire was used to collect data from the villagers by face to face interview.

Results

Table I Socio demographic profile of respondents (n=127)

Variables□	Frequency□	Percentage (%)
Age		
<18 years□	37□	29.14
18-27 years□	14□	11.20
28-37 years□	54□	42.52
38-45 years□	18□	14.18
45-57 years□	02□	1.58
>57 years□	02□	1.58
Gender		
Female □	68□	53.54
Male□	59□	46.46
Occupation		
Farmer□	2□	1.58
Fisher men□	1□	0.79
Businessman□	20□	15.75
Housewife□	25□	19.68
Service holder□	79□	62.20
Education		
Primary□	33□	25.98
Secondary□	51□	40.16
Higher secondary□	28□	22.05
Honors and above□	15□	11.81
Monthly income		
<20,000/= BDT□	12□	9.45
20-50,000/= BDT□	75□	59.06
>50,000/= BDT□	40□	31.49
Socioeconomic class		
Upper middle class□	8□	6.30
Middle class□	60□	47.24
Lower middle class□	59□	46.46

The study revealed that 54(42.52%) respondents were aged between 28-37 years and only 2(1.58%) were aged more than 57 years. Out of 127 villagers, majority 68(53.54%) respondents were females and 59(46.46%) were males. 79(62.20%) were service holder and 25(19.68%) were housewives. Regarding education,

51(40.16%) had secondary level of education and 15(11.81%) were graduates. 75(59.06%) had monthly income between BDT 20,000 BDT to 50,000 and 40(31.5%) more than TK, 50,000 per month. 60(47.24%) belonged to middle class and only 8(6.3%) from upper middle class.

Table II Knowledge of the responding villagers on dengue (n=127)

Question □	Response □	Frequency□	Percentage (%)
Dengue is a disease□	Yes □	127□	100.0
Dengue fatality□	Yes □	125□	98.4
Disease transmission□	By mosquito bite □	108□	85.04
□	Don't know□	19□	14.96
Transmission media □	Water□	55□	43.3
□	Air□	15□	11.8
□	Contact□	57□	44.9
Breeding site□	Dustbin□	30□	23.62
□	Clean stored water□	68□	53.54
□	Polluted water□	13□	10.23
□	Don't know□	16□	12.61
Biting time □	Day time□	21□	16.54
□	Night□	35□	27.55
□	Anytime □	71□	55.91
Dengue recurrence □	Yes □	104□	81.9
□	No □	23□	18.1
Breeding season □	Summer□	25□	19.69
□	Rainy season□	83□	65.35
□	Winter□	19□	14.96

The above table revealed that almost all 127(100%) respondents knew that dengue is infectious and 125(98.4%) knew that dengue can lead to death. 108(85%) mentioned that a person get infected by dengue virus due to mosquito bite, 68(53.5%) had idea that mosquito laid eggs in clean stored water. 71(55.9%) expressed that mosquito can bite any time, 104(81.9%) knew that dengue can occur more than once and 83(65.35%) told that dengue mosquito breed during rainy season.

Table III Knowledge regarding symptoms, prevention and consequences of untreated dengue (n=127)

Variables□	Frequency □	Percentage (%)
Symptoms of dengue		
Fever □	12□	9.5
Rashes □	6□	4.7
Muscle pain □	21□	16.5
Joint pain□	20□	15.7
Fever and rash□	18□	14.2
Multiple symptoms□	50□	39.4
Prevention of Dengue fever		
Spray insecticide□	29□	22.8
Taking medicine□	27□	21.3
Clean home & surrounding□	71□	55.9
Consequences of untreated dengue □ □		
Hemorrhage □	27□	21.26
Pneumonia□	39□	30.71
Shock□	11□	8.66
Others & Death□	50□	39.37

The above table revealed that 50(39.4%) of the respondents depicted symptoms of dengue as fever with rashes, headache, joint pain and only 12(9.5%) expressed fever as only symptom. To prevent dengue majority 71(55.9%) narrated that cleaning home and surroundings are the best possible ways to prevent dengue fever, 29(22.8%) mentioned about insecticidal spraying. The above table focus that 50(39.4%) of the respondents illustrated that untreated dengue can lead different serious effects and death, only 11(8.66%) narrated about shock development.

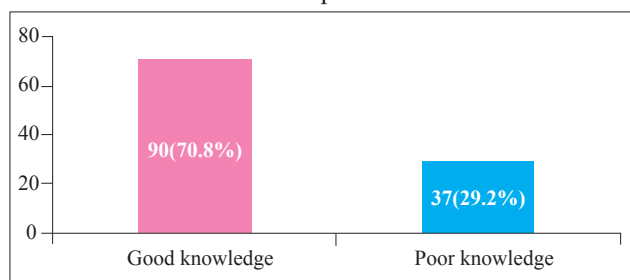


Figure 1 Knowledge of the respondents regarding dengue (n=127)

Majority 90(70.8%) disclosed good knowledge on the disease, the rest 37(29.2%) had inefficient idea on the disease.

Table IV Attitude towards dengue fever (n=127)

Attributes	Response	Frequency	Percentage (%)
Dengue fatality	Agree	92	72.44
	Disagree	10	7.87
	Don't know	25	19.69
Community responsibility	Disagree	18	14.17
	Neutral	15	11.81
	Agree	94	74.02
Prevention priority	Disagree	28	22.04
	Agree	99	77.95
Adequate information	Disagree	37	29.1
	Agree	90	70.9
Vaccine intake (if available)	Agree	127	100.0
Treatment hospital	Disagree	30	23.6
	Agree	97	76.4

Among the respondents, 92(72.44%) believed that dengue is fatal, 99(78%) expressed mosquito bite prevention is better than dengue treatment. Among 127 respondents, 94(74.02%) trusted that dengue prevention is every ones responsibility, 90(70.9%) said health care providers information is enough for dengue prevention. All respondents 127(100%) said they will accept dengue vaccine if provided and 97(76.4%) preferred that hospitals as the best place for dengue treatment.

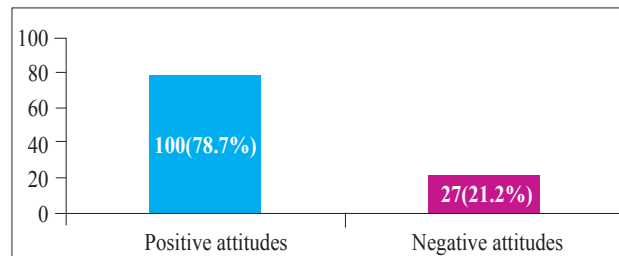


Figure 2 Distribution of respondents according to their attitude towards dengue fever (n=127)

The above bar chart revealed that majority 100(78.7%) of the respondents attitude was positive and only 27(21.2%) expressed negatively on the severity and problem of dengue.

Table V Practice of different remedial measures for dengue (n=127)

Preventive measures	Response	Frequency	Percentage (%)
Breeding place cleaning	Yes	27	21.26
	No	100	78.74
Water storage checking	Yes	58	45.67
	No	69	54.33
Mosquito net use	Yes	45	35.43
	No	82	64.54
Tab and flower vass cleanliness	Yes	2	2.83
	No	98	77.17
Mosquito repellent use	Yes	45	35.43
	No	82	64.57
Treatment compliance	Yes	67	52.76
	No	60	47.24
Fogging	Yes	38	29.92
	No	89	70.08

The table revealed that only 27(21.26%) cleaned the mosquito breeding sites, 58(45.67%) regularly checked water storage container and 29(22.83%) sometimes changed water from plant pots and flower vases. 45(35.43%) used mosquito net all times and used mosquito repellants, 67(52.76%) followed prescribed medicine and diet and only 38(29.9%) persons arranged for regular fogging.

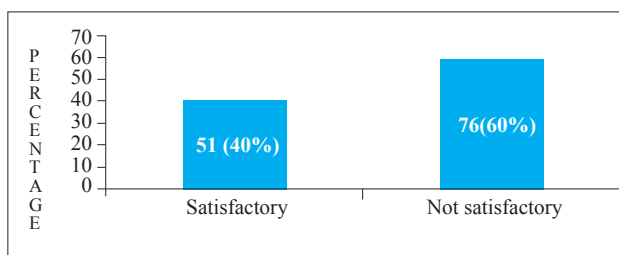


Figure 3 Satisfaction level of the respondents to counteract dengue (n=127)

The above bar chart showed that only 51(40%) respondents practice towards dengue fever was satisfactory, 76(60%) had non satisfactory mentality.

Discussion

In the current study 54(42.52%) respondents were aged between 28-37 years and only 2(1.58%) were aged more than 57 years, meanwhile in another similar study majority (72.32%) were aged 18 to 39 years old.²⁸ The study revealed that majority 68(53.54%) respondents were females and 59(46.46%) were males. In another similar study showed that 271 (51.52%) were male and 255 (48.48%) were female.³⁷ Among the 127 respondents, 51(40.16%) had secondary level of education, 15(11.81%) were graduates, 79(62.2%) of the respondents were service holder, 108(85%) of the respondents were married, 51(40.16%) hailed from joint family, 60(47.24%) belonged to middle class and only 8(6.3%) from upper middle class. 75(59.06%) had monthly income between BDT 20,000 to 50,000. Meanwhile in another study 36.6% were graduates, 23.19% were service holder, 78% belonged to nuclear family, 64.34% were married and 11.97% had income more than BDT 40,000.²⁸ This study revealed that majority 77(60.6%) lived in concrete houses, 25(19.5%) lived in tin shed houses, whereas in another similar study it was seen that 5.7% respondents who lived in tin-shed houses, majority (94.3%) lived in buildings.³⁷ Almost all respondents had idea that dengue is infectious, 125(98.4%) told that dengue can lead to death, 108(85%) knew that a person get infected by dengue virus due to mosquito bite, 68(53.54%) narrated that mosquito laid eggs in clean stored water, 71(55.91%) expressed that mosquito can bite any time, 104(81.9%) mentioned that dengue can occur more than once and 83(65.35%) knew dengue mosquito breed during rainy season. 50(39.4%) of the respondents expressed that fever with rashes, headache, joint are the symptoms of dengue fever, 71(55.9%) knew that cleaning home and surrounding are the best possible ways to prevent dengue fever, 50(39.4%) knew that untreated dengue can lead to death and other serious matters. Meanwhile in the study of Ranjit it was seen that 66.3% told it is a viral disease, 93% knew dengue spread through mosquito bite, 71% said aedes mosquito breed in dirty and unclean water, 75% knew dengue can be epidemic. 91% said fever is a symptom of dengue fever and 70% said rash is a symptom of dengue fever.²⁸ In this study among 127 respondents, 90(70.8%) had good knowledge about dengue fever and 37(29.2%) level of knowledge was poor. This study

revealed that 92(72.44%) believed that dengue can be fatal, 99(78%) believed mosquito bite prevention is better than dengue treatment. Among 127 respondents 94(74.02%) believed that dengue prevention is every ones responsibility, 90(70.9%) said health care providers information is enough for dengue prevention. All the respondents said they will accept dengue vaccine if provided and 97(76.4%) said hospitals are the best place for dengue treatment. Meanwhile in another similar study by Banik et al.2013, 79.55% felt that dengue fever is dangerous, 62.59% felt that dengue can cause death, 64.84% believed that government agencies are responsible for eradication of mosquitoes, 67.58% believed that community people are aware about preventive measures.²⁸ Positive attitudes regarding prevention and treatment of dengue fever was seen in 100(78.7%) persons while 27(21.2%) persons showed negative attitudes, which is evident in the current study (Figure 2). Meanwhile the proportion of positive and negative attitude was 74.33% and 25.67% respectively which was observed by the study of Priyanka.³⁷ Regarding practice, the researchers of this survey found that only 27(21.26%) cleaned the mosquito breeding sites, 58(45.67%) regularly checked water storage container, 29(22.83%) sometimes changed water from plant pots and flower vases, 45(35.43%) used mosquito net all times and used mosquito repellants, 67(52.76%) followed prescribed medicine and diet and only 38(29.9%) persons called city corporation for regular fogging (Table V). Meanwhile in another similar study by Malhotra et. al. done in Patiala revealed that the preventive practices used at home by the respondents, majority of them used mosquito mats/coil/liquid vaporizer (68.44%) followed by mosquito spray (55.6%). Mosquito repellants/ coils/vaporizers were used mostly during night time (64.23%). Coolers were used by 81% of respondents but majority of them (75.5%) were not checking their coolers for mosquito larvae and 53.6% change water in their coolers after one week.⁴¹ The overall proportion of practice was not satisfactory in this study. Only 51(40%) of the respondents practice was satisfactory (Figure 3). Meanwhile in another similar research study by Barua et al. which was done in Dhaka city of Bangladesh, the prevalence of satisfactory practice was seen only among 28% of the respondents.³⁷

Limitations

- Time limitation.
- The research was conducted in one single village. Its result cannot be generalized for whole country.

Conclusions

The findings of this study depicted a good level of knowledge regarding dengue among the participants. Regarding dengue prevention, although participants scored highly in several indicators, the overall preventive practices were not satisfactory. This suggests that there is a pressing need for expanded education for increasing public awareness on dengue and encourage preventive practices within rural communities in Bangladesh.

Recommendation

Practical, family-oriented and community-based health education campaigns must be tailored to increase dengue knowledge, deter negative community beliefs, and encourage dengue preventative practices in rural communities of Bangladesh.

Disclosure

The authors declare no conflict of interest.

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