Original Article

Knowledge on Dengue Fever and Its Preventive Measures among Adult Population in Rural Rajshahi, Bangladesh

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Abstract

Background: *Dengue, the mosquito born disease has become a public health problem in Bangladesh due to its gradual increase in morbidity and mortality since 2000. In 2023 the country witnessed the worst ever dengue outbreak which covered both urban and rural area.*

Objective: *The study was conducted to assess knowledge regarding dengue and it's preventive measures among the adult population of Puthia and Paba upazilla under Rajshahi district.*

Materials and Methods: *This was a cross sectional type of descriptive study which was carried out among rural adult people in Puthia and Paba upazilla under Rajshahi district. The sample size was 364, which was selected purposively. The data were collected from the respondents according to a semi structured questionnaire by face to face interview and then data were analyzed by using SPSS software.*

Results: *Among the 364 respondents majority (53.31%) were in the age group 18-40 years and 50.82% were housewives by occupation. Majority (51.6%) of the respondents possesses insufficient knowledge & 48.4% respondents possess sufficient (> 60% correct answer) knowledge about dengue and its preventive measures. It was found that sufficient knowledge was more among the respondents having higher education which was significant (P<0.05).*

Conclusion: *Dengue is rising in Bangladesh at an alarming rate and extending in the rural area. So everyone should possess proper knowledge and information regarding dengue and it's prevention otherwise it will make a havoc in Bangladesh.*

Keywords: *Knowledge, Dengue, Preventive Measures.*

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Introduction

Dengue, a mosquito-borne viral infection transmitted by the bites of Aedes mosquitoes, mainly Aedes aegypti and Aedes albopictus has emerged as a significant global public health challenge. Approximately 3.8 billion people in 128 countries are at risk of dengue infection. According to the WHO, about 20,000 deaths occur annually due to dengue globally.[1, 2] Dengue fever (DF) is caused by any one of the four serotypes (DENV-1, 2, 3 and 4) of the dengue virus and can develop into a severe disease marked as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS).[3-5]

The first dengue virus infection was found in South-East Asia and the disease poses a persistent threat to nearly half of the world's population.[6] Bangladesh is situated in South Asia and has become an appropriate habitat for the dengue vector and its transmission.[7] In Bangladesh, the first dengue outbreak was detected in 1964.[1] The sporadic cases and small outbreaks suggest that the dengue occurred across the country from 1964 to 1999 but those were not officially reported.[8,9] In the year 2000, a severe outbreak of dengue occurred in Bangladesh with 93 mortality among 5551 morbidity cases.[10] In subsequent years, dengue cases reduced remarkably to as low as 375 cases

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in 2014, However, in 2016, around 6100 dengue cases had been reported with a DENV-2 outbreak in Bangladesh.[11] Three years later, in 2019, Bangladesh experienced the highest annual dengue incidence ever reported, with 112,000 cases and 129 deaths.[12]

The occurrence and transmission of dengue are provoked by many factors such as uncontrolled population growth, urbanization, deterioration in waste management systems [13] and lack of effective vector control.[14] Inadequate water supply and drainage management are also regarded as major contributors to dengue epidemics.[14] Moreover, illiteracy, poverty, and other social factors have been associated with poor dengue control management.[15] Since there is no effective vaccine for preventing dengue, the only preventive method is vector control.[16] A previous study indicated the misconceptions of public knowledge regarding causes of dengue disease and its symptoms with severity.[17] Therefore, education about dengue is essential at the grassroots level.[5] Effective dengue prevention and control are important concerns in Bangladesh today as there is an additional challenge to ensure proper treatment despite continued progress in dengue research worldwide.[18,19] Therefore, the objective of this study was to assess the nationwide knowledge on preventive measures of dengue.

Materials and Methods

This descriptive type of cross-sectional study was conducted at the Islami Bank Medical College's Department of Community Medicine over two months (November-December 2022). It included 364 adults aged 18+ and above from Puthia and Paba Upazilla of Rajshahi. Exclusions comprised individuals with below 18 years of age and who refused to participate in the study. Purposive sampling and semi structured questionnaire was developed by our research team.

Before conducting the actual data collection, the questionnaire was pilot tested in a community with similarities to the study population. There were 11 questions in second section from which nine close ended questions were used to assess the knowledge score where no specific scale was taken to measure this. But according to a previous country wide study [20] we evaluated the knowledge. Multiple questions were responded from scoring system. According to our criteria, for ‘‘sufficient knowledge”, the respondent needed to have correct responses to at least six questions out of 9. Less than six correct responses were termed ‘‘insufficient knowledge. Participant’s [correct = 1, incorrect = 0, don’t know =0], overall score was between 0 and 9 and the cutoff score for sufficient and insufficient knowledge was 6. Score 6 or more considered as sufficient knowledge, and score less than 6 were considered as insufficient knowledge. At every step of data collection, processing and analysis data were checked for accuracy. The data were analyzed by using SPSS software version 26.

Results

Table I: Socio-demographic characteristics of the respondents.

Characteristics	Frequency	Percentage (%)
Age Group (Year)		
18 - 40	194	53.3
41 - 60	130	35.7
> 60	40	11.0
Mean ± SD	41.60 ± 14.72	
Gender		
Male	161	44.2
Female	203	55.8
Living place		
Urban	16	4.4
Rural	348	95.6
Literacy status		
No formal schooling	101	27.7
Primary	105	28.8
Secondary & Higher Secondary	131	36.0
Graduate & above	27	7.5
Employment status		
Entrepreneur	34	9.3
Govt. job	7	1.9
Non govt. job	16	4.4
Farmer	53	14.6
Day labour	36	9.9
Housewife	185	50.8
Others	33	9.1
Family Income (taka/month)		
≤ 15,000	235	64.6
< 30,000	97	26.6
< 50,000	22	6.0
> 50,000	10	2.7
Mean ± SD	1.47 ± 0.732)	
Drainage system		
Yes	253	69.5
No	111	30.5

In Table-I shows socio-demographic characteristics of 364 respondents in total. The majority of respondents (53.3%) were within the age group of 18–40 years with an average age of 41.60 ± 14.72 years and 55.8% were female. Rural areas as living place were accounted for the majority (95.6%). About 27.7% people had never attended any formal education, compared to about 36.0% who had finished secondary and higher secondary school. More than half (51.8%) were housewife and majority of the respondents (64.6%) had monthly family income of less than 15,000 BDT. Furthermore, (69.5%) had a drainage system.

Table II: Knowledge on dengue fever and its preventive measures.

Variables	Frequency	Percentage (%)
1. Ever heard about Dengue fever		
No	2	0.5
Yes	362	99.5
2. Dengue fever is either bacterial or viral disease		
Viral	123	33.9
Bacterial	13	3.6
Others	9	2.5
Don't know	217	59.8
3. Dengue can be transmitted by		
Mosquito's bite	320	88.2
Water	41	5.0
Food	1	.3
Don't know	23	6.3
4. The name of the mosquito vector of dengue fever is (n=320)		
Female aedes	119	3 7 . 2
Anopheles	2	0 .6
All types of mosquito	9	2 . 8
Don't know	19 0	5 9. 4
5. Biting times of Aedes mosquito is (n=320)		
Early in the morning	43	13 .5
Evening	146	45 .6
All the time	91	2 8 . 4
Don't know	4 0	1 2 . 5
Total	32 0	100 .0
6. Breeding places of Aedes mosquito is (n=320)		
In stagnant freshwater	2 7	8.5
In stagnant fresh and dirty water	28 2	8 8 .1
Don't know	11	3.4
7. Dengue prevalent season is		
Rainy season	300	83.6
Summer season	40	11.0
All the season	5	1.5
Don't know	14	3.9
8. Vaccine available against dengue		
No	236	6 5 . 2
Yes	126	34. 8
9. Signs & Symptoms of dengue fever		
Incorrect knowledge	3	0.8
Correct knowledge	314	86. 7
No knowledge	45	12.5
10. Preventive measures are		
Use mosquito net	21	5.8
Used mosquito coil & spray	3	0.8
Others	2	0. 6
Knows more than one preventive measure	336	92. 8
11. Source of information regarding prevention		
Tv / Radio	163	4 5.0
Health care professionals	6	1.7
Others	38	10. 5
Knows more than one source of information	155	42. 8

Table II shows the different type of variables according to knowledge about dengue fever and its preventive measures. The majority of respondents (99.5%) heard about dengue fever. Among those only (33.9%) knew that it was viral disease, in contrast majority (66.1%) was unsure about it . Most of the respondents (88.2%) knew that mosquito bites can transmit dengue. Furthermore, 37.2% of respondents had knowledge that the female Aedes mosquito responsible for the transmission of the dengue virus. Additionally, 28.4% of people were correctly able to identify the biting times of the dengue mosquito and 83.6% knew that dengue was highly prevalent during the rainy season. Only 8.5% were aware that the dengue mosquito breeds in stagnant fresh water. Among the respondents, 65.2% said the dengue vaccine was not available, while 34.8% told it was available. Also The majority (86.7%) had knowledge about the signs and symptoms of dengue fever.

When asked about strategies for preventing mosquito breeding, 92.8% of participants knew more than one method. On the other hand 0.8% and 5.8% considered mosquito coils and mosquito nets to be the most effective prevention options respectively. About 42.8% of respondents learned about prevention from many sources compared to 45.0% who learned about it from TV or radio.

Table-III, in response to a question concerning the specific treatment, 21.5% of respondents said that there was no specific treatment. On the other hand 53% were aware that the course of treatment was symptomatic. Most of the respondents (94.5%) knew that the lack of proper treatment was the cause of mortality. The majority of the respondents (91.5%) knew when the test would actually take place. Additionally, the majority (86.5%) were aware of preventive measures.

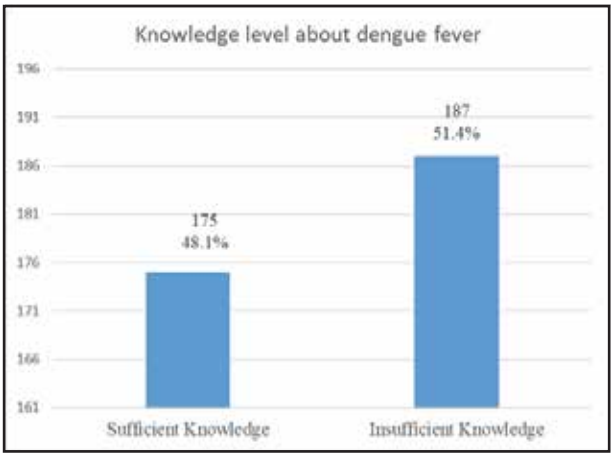
Table III: Knowledge level about dengue treatment.

Variables	n	(%)
1. Specific treatment for dengue fever is available		
Yes	165	45.6
No	78	21.5
Don't know	119	32.9
2. Symptomatic treatment available n= 78		
Yes	42	53
No	6	7.6
Don't know	30	38.46
3. Deathoccur without proper treatment		
No	3	0.8
Yes	342	94.5
No knowledge	17	4.7
4. Test available for suspected dengue fever		
Incorrect knowledge	21	5.8
Correct knowledge	333	91.5
No knowledge	8	2.2
5. Preventive measures for dengue is available		
Yes	313	86.5
No	17	4.7
Don't know	32	8.8

Table IV: Association between different factors and knowledge level of the respondents.

Variables	Knowledge level		χ^2	*p-value* (Significance)
	Sufficient 5 - 8	Insufficient <5		
Age group (years)				
18 - 40	92 (52.6%)	162 (54.5%)		
41-60	65 (37.1%)	63 (33.7%)	.550	.760
> 60	18 (10.3%)	22 (11.8%)		
Living place				
Urban	8 (4.6%)	8 (4.3%)	.018	.892
Semi-urban	167 (95.4%)	179 (95.7%)		
Literacy status				
No schooling	38 (21.7%)	62 (33.2%)		
Primary	44 (25.1%)	60 (32.1%)	21.836	.000
Secondary to higher secondary	70 (40.0%)	61 (32.6%)		
Graduation and above	23 (13.1%)	4 (2.1%)		
Employment status				
Housewife	79 (45.1%)	105 (56.1%)		
Service	18 (10.3%)	5 (2.7%)	10.642	.005
Day labour	78 (44.6%)	77 (41.2%)		
Family Income (tk/month)				
< 15,000	96 (54.9%)	137 (73.3%)		
< 30,000	59 (33.7%)	38 (20.3%)	14.288	.003
< 50,000	15 (8.6%)	7 (3.7%)		
> 50,000	5 (2.9%)	3 (2.7%)		
Type of family				
Nuclear	107 (61.1%)	106 (56.7%)		
Joint	67 (38.9%)	81 (43.3%)	.742	.389
Drainage system				
Yes	126 (72.0%)	125 (66.8%)		
No	49 (28.0%)	62 (33.2%)	1.130	.288

Figure 01: shows the distribution of the respondents' knowledge levels about dengue fever (n=362). Among the respondents 48.1 % had sufficient knowledge about dengue fever, while 51.4% had insufficient knowledge.



In Table IV the relationships of the level of knowledge about dengue fever with literacy status, employment status, and family income was statistically significant ($p < 0.05$). However, there were no significant relationships of knowledge about dengue fever with age, living place, type of family, and drainage system ($p > 0.05$).

Discussion

Vector-borne diseases like dengue are perceived as a major public health threat in Bangladesh. To control the dengue virus it was revealed that lack of knowledge about clinical features or control measures in the community was the most common problem.[20] In the present study, nearly most of the respondents heard of dengue though many of the research participants did not have still basic knowledge of dengue. For example, there were still misconceptions about the breeding sites of the dengue vector. Many of the respondents stated that dirty and unclean water such as sewage drains are the most common breeding sites for dengue mosquitoes.

This knowledge level of dengue fever found in our study was 48.1%. Knowledge level of previously conducted country wide study was 65.9% which is similar KAP finding India, Pakistan , Malaysia, Thailand, Brazil and Jamaica.[20-26] This difference is due the study was done in rural area and the area was not outbreak area. In this study 88.2% respondents mentioned that dengue spreads through mosquito bites which is similar to other studies done in India, Malaysia and Brazil .[27-29] But 59.8% of the respondents don't know the transmission of dengue virus (DENV). 40.2% of respondents reported that mosquitoes bite during the period of sunset or evening time. . This finding was similar to some previous studies which were performed in different countries where majority of respondents knew that dengue vectors might bite at sunrise or sunset.[25, 30]

Majority of the respondents 44.8% in this study indicated that television/radio was the most common source of DF information. Similar findings were reported in previous studies from India, Indonesia, Nepal, Laos and the Philippines.[31-35] This indicated that the mass media have an impact to convey health information more rapidly to the general people in Bangladesh. A study from Laos where friends or relatives were the major source of information regarding dengue fever.[36] Health personnel were also mentioned as a source of dengue fever information in a study from Thailand.[37]

Dengue fever can be avoided by using preventive measures. For personal-protective measures, in this study it was found that most of the respondents [92.3%] used multiple personal protective measure such as mosquito net , coil , whereas in country-wide study 38.5% and 22.1% respondents were use mosquito coils and mosquito nets considered the most effective options for prevention while some (5.8%) were used mosquito net.[20] This study found, literary status and monthly family income were significantly associated with the overall knowledge of the participants .This finding consistent with a result from country wide study.[20]

Conclusion

In developing country like Bangladesh, Dengue an emerging disease is an important public health concern hence appropriate intervention program is needed. The main cause of increasing trend of dengue, in this highly populated country are lacking of knowledge on dengue epidemiology and vector bionomics. So, an emphasis should be provided to increase community knowledge and awareness towards Aedes mosquitoes and DF prevention by improving health education programme especially on dengue disease.

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