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A survey on the knowledge, awareness & prevention about dengue among the university students of Bangladesh

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Abstract

Our goal is to increase national awareness about dengue. The increasing number of dengue cases affects males, women, and individuals of all ages. This study aims to determine the awareness levels, familiarity with linked health issues, and understanding of the current dengue-related situation in the country among university students. As part of the methodology, this study included a larger number of students from Bangladesh's tertiary education system. Twenty-four questionnaires were provided to randomly selected students from a variety of areas (e.g., Pharmacy, LLB, Microbiology, Civil, EEE, English, MBA, etc.). Data was collected anonymously from 206 different people. Students from Stamford University Bangladesh made up the bulk of the participants, with the remainder students coming from universities like as North South University, East West University, Titumir Girls' College, Siddeshwari Girls' College, University of Asia Pacific, etc. According to the results of our poll, over 62% of pupils have dengue. Here, we discovered that because of their unhygienic practices, 41% of the population is coping with this sickness. Additionally, some people were found to be ignorant of Bangladesh's public health system. We may plan public awareness campaigns and lectures, especially for students. We could take action to maintain a clean environment. In this aspect, the government has to exercise more prudence. They should provide medicine and bug repellent for our safety. We might provide assistance to those who are already suffering from severe dengue and educate others who are not yet afflicted about the need of staying away from dengue mosquitoes.

Keywords: Dengue, survey, awareness, knowledge, prevention

Introduction

Dengue: Dengue virus is carried by Aedes mosquitoes. The flavivirus known as dengue has four antigenically distinct serotypes. An estimated 2.5 billion people, primarily in countries in south and south-east Asia, are at risk because of this rapidly spreading health problem. Many reasons, including increased urbanization, population growth, migration, and international travel, as well as the difficulties in effectively managing vectors, are thought to be contributing to the spread of dengue. Climate change may affect the dengue virus's ability to spread globally. Between 50 and 100 million individuals are estimated to have dengue each year, with 500,000 of those cases being severe and possibly lethal. The health and economics of people have suffered greatly as a result of many dengue epidemics in urban areas ^[1]. Aedes mosquitoes that live in trees and non-human primates are examples of the sylvatic cycle seen in Southeast Asian forests. The domestic Aedes aegypti and peridomestic Aedes albopictus mosquitoes are essential to the human cycle in the tropics and subtropics. The sylvatic strain of DENV is among the most recent outbreaks ^[2]. The 2009 WHO classification divides dengue fever into two categories: uncomplicated and severe, while the 1997 WHO classification is still often used. In 1997, three separate forms of dengue fever—dengue fever, dengue fever, and dengue hemorrhagic fever—were recognized ^[3].

Symptoms of Dengue

Patients with dengue typically have an abrupt onset of fever during the early acute febrile phase of the illness, which is occasionally accompanied by aches, pains, and nausea. When used to prospectively selected patients who reported with acute febrile illness within 72 hours after fever onset, there was a similar sensitivity of over 95% in young persons with

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poor specificities of less than 40%. Dengue can be observed up to 5.1 and 4.4 days after the onset of the disease for both elementary and secondary infections, respectively, and as early as 2 to 3 days prior to the onset of fever. During this viremic phase, viruses can be isolated using blood, serum, or plasma samples [4]. The four main symptoms of dengue fever are as follows: A high fever that lasts for two to seven days; A propensity to bleed as demonstrated by petechiae, epistaxis, or a positive tourniquet test; Thrombocytopenia (platelet count $<100 \times 10^9/l$); and Evidence of plasma leakage, which can manifest as ascites, hemoconcentration, pleural effusion, etc. [5].

Treatment of Dengue

Between 2500 and 3000 million people worldwide are now at risk from dengue, and the virus infects roughly 20 million people in tropical and subtropical countries each year. Better management procedures have resulted in a 1% to 2% drop in the mortality rate. The most common causes of mortality are multiple organ failure, excessive bleeding, and uncontrolled shock. The mainstay of therapy for severe dengue fever is supportive care along with careful hydration control. Although several empirical therapies such as steroids, fresh frozen plasma, platelet transfusions, immunoglobulins, and other treatments are used, no one evidence-based therapy has been demonstrated to alter the outcome [6]. Dengue is a major public health concern that is spreading increasingly often. Following every rainy season, waves of dengue illnesses follow seasonal fluctuations in the climate. Despite being against the same serotype, infection does not provide temporary protection against other dengue virus serotypes [7].

Prevention of Dengue

Use insect repellent during the day to prevent mosquito bites. Wear long gowns, stockings, and full-sleeved garments to cover your limbs. When using repellents around extremely young children or the elderly, exercise caution. Use electric vapor mats and coils during the day to prevent mosquito bites. Use insecticide-treated nets (ITNs) to protect small children, expecting women, the elderly, and anybody else who might relax during the day. To discourage or get rid of mosquitoes, hang bamboo or cloth curtains coated with insecticide at doors or windows [8].

The illness was initially identified as "Dacca fever" when dengue was found in Bangladesh in 1964. The main city of Bangladesh, Dhaka, saw a major outbreak in 1999, and in 2000 there was a pandemic. The capital city of Dhaka, was found to be the most endemic urban dengue location in the country during many dengue outbreaks between 2000 and 2009 [9]. Bangladesh, a nation of over 165 million people in South Asia, has been endemic for dengue since the first recorded outbreak in 2000. Moreover, the bulk of this surveillance system was focused on the city of Dhaka prior to the 2019 outbreak. As of right now, just fifty out of the several hundred hospitals and clinics in Dhaka city—17 public and 33 private—are responsible for reporting dengue cases to the surveillance system. The number of dengue infections in Bangladesh skyrocketed in 2019.

Predictions indicate that this city will be the epicenter of DF outbreaks in the future [10]. Bangladesh has seen several natural catastrophes, and infectious illnesses are now widespread there as well. Dhaka, the capital of Bangladesh,

serves as the hub for all-important operations. It is also one of the most densely inhabited areas in the globe [11].

Dengue is the mosquito-borne disease that spreads the fastest, posing a serious danger to public health, especially in tropical and subtropical nations like Bangladesh. This survey aims to determine the awareness levels, familiarity with linked health issues, and knowledge of university students on the current dengue-related situation in the country and other comparable settings throughout the globe.

Methodology

Samples, Procedures and Materials

Higher education students participated in this survey, which was conducted in Bangladesh between October 2023 and January 2024. Students from Stamford University Bangladesh made up the bulk of the participants, with the remainder students coming from universities like as North South University, East West University, Titumir Girls' College, Siddeshwari Girls' College, University of Asia Pacific, etc. Students were chosen at random from a variety of areas, including English, MBA, Microbiology, Civil Engineering, Pharmacy, and LLB. In addition to being enrolled as graduate or undergraduate students at one of these universities, participants had to be willing to participate in the survey. An anonymous questionnaire together with a letter outlining the study's objectives, confidentiality, and voluntary nature of participation were given to 206 students, a representative sample. Roughly, 96% of the surveys that were returned indicated that a response had been received. Each student received 24 questions on dengue; they were asked to answer them honestly, and the data was gathered. Microsoft Excel 2019 was used in this investigation to calculate data.

Questionnaires

1. Name -
2. Gender - Male Female Prefer not to say.
3. Age -
4. Marital status - Married Unmarried
5. Name of the University or Institute-
6. Name of the Department-
7. Area-
8. Do you know about Dengue- Yes No
9. Have you or a family member ever had a Dengue? Yes No
10. If yes then who? Me A Family Member
11. What are the Sources of the Aedes Mosquito? (Write 5 Sources)
12. What are the Symptoms of Dengue? (Write 5 Symptoms)
13. Which Blood Cells are reduced in Dengue?
14. Plasma RBC (Red Blood Cell) WBC (White Blood Cell) Platelets
15. Name of Dengue tests- NS1 IgM Antibody IgG Antibody All of the above
16. Which Foods or Drinks increase Blood Platelets? (Write 5 Types)
17. Which month is the Dengue peak season in Bangladesh?

18. January to April April to May August to October October to December
19. Which areas of Bangladesh have higher rates of Dengue? (Approx. 2020-2023)
 Dhaka Chitagong Barisal Mymensingh
21. Do you know that Children are Dying more in “Dengue Shock Syndrome”?
 Yes No
22. Yes No
23. Steps that we can take to reduce spreading Dengue Infection (Write 5 Steps)-
24. Do you support the Steps that are taken by the Govt. to Prevent Dengue?
 Yes No
25. Yes No
26. What more steps should Govt. has to take for Preventing Dengue in Bangladesh? (Write 5 steps)
27. What is your opinion on Dengue Prevention?
28. Do you believe a Campaign is necessary to stop Dengue or lower the Infection rate?
 Yes No

What kind of Campaign do you think is needed to Prevent or Reduce the rate of Dengue?

Results

The Respondents’ Demographics Characteristics

The majority of the data for this study came from Stamford University Bangladesh; the remaining students are from other Bangladeshi universities. We got information from 206 different people. While every participant in the data we have collected is between the ages of 22 and 27, 84% of the students are 23 years old, and 12% are 22 years old. The remaining pupils are not all the same age.

Table 1: Demographic Characteristics of Respondent Students

Variable	N	Percentage (%)
Gender		
Male	105	51
Female	101	49
Age		
22	25	12
23	174	84
24	2	1
26	2	1
27	3	1
Marital Status		
Married	20	10
Unmarried	186	90

We gathered data from 101 female students (representing 49% of the sample) and 105 male students (51% of the sample). Only 10% of participants are married, and 90% of participants are single.

Departmental Distribution among Students

The sample consisted of participants from several disciplines, with the following categories: 100 students (48% of the sample) were in the pharmacy discipline; 16 students (8%) were in the LLB discipline; 13 students (6% of the sample) were in English; 11 students (5% of the sample) were in the Civil discipline; and 10 students (5% of the sample) were in Microbiology. Among the sample, there

were nine students from CSE (4%), eight from Zoology (4%), six from MBA (3%), five from EEE (2%), four from Management (2%), four from Accounting (2%), and four from Marketing (2%). Additionally, 1 to 3 persons (1% of the sample) make up the remaining pupils.

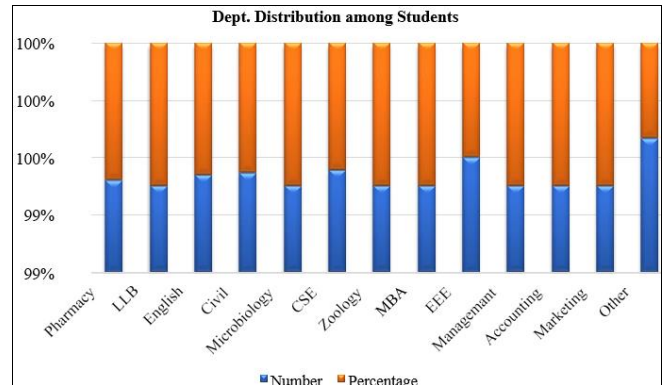


Fig 1: Departmental Distribution among Students

Knowledge about Dengue

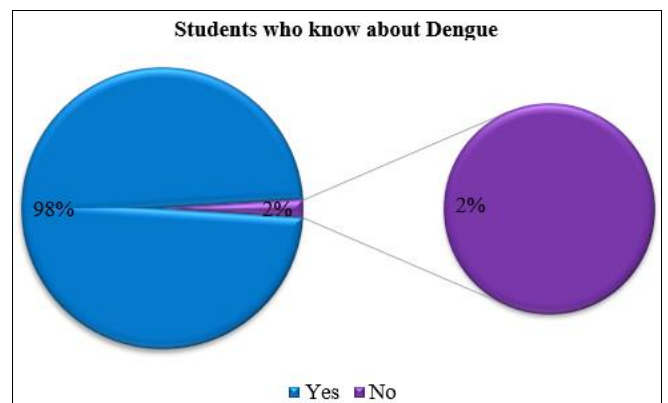


Fig 2: Students who know about Dengue.

This graph shows that 98% of students are aware of dengue, whereas just 2% have never heard of it.

Experienced Dengue Fever

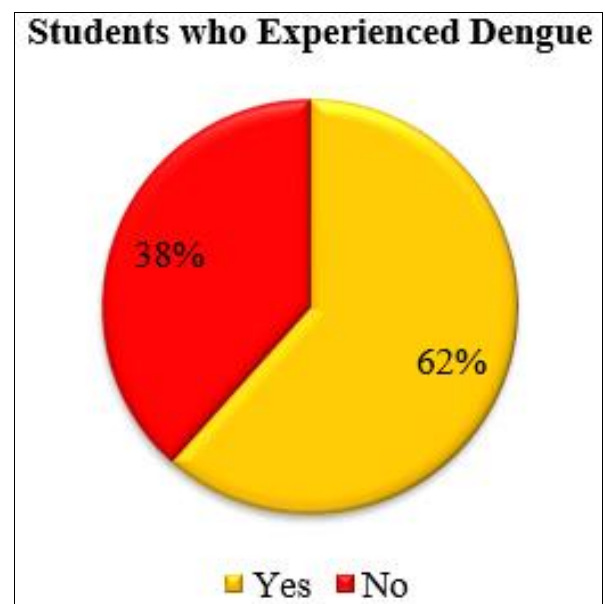


Fig 3: Students who Experienced Dengue.

We also found that 62% of pupils had contracted the Dengue virus, whereas 38% had not. These findings are shown in the chart.

The Mosquito that Causes Dengue

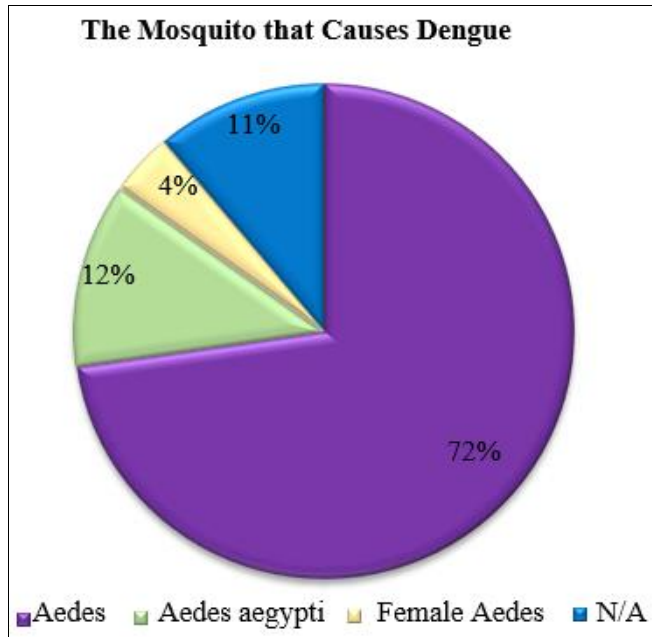


Fig 4: The Mosquito that Causes Dengue.

Sources of the Aedes Mosquito

Table 2: Sources of the Aedes Mosquito

Sources	N	Percentage (%)
Storage water, Rainwater	45	22
Tropical, subtropical and in some temperate climates	21	10
Dirty places	28	14
Moist area	8	4
Urban area	17	8
Other sources	30	14
N/A	57	28

We can observe the origins of mosquito reproduction across this entire table. Thus, storage water and rainwater were cited as sources by 45 students (22% of the sample); tropical, subtropical, and in some temperate climates by 21 students (10% of the sample); dirty places by 28 students (14% of the sample); moist areas by 8 students (4% of the sample); urban areas by 17 students (8% of the sample); and other sources such as natural containers, man-made containers, plastic bottles, old flower vase, tree holder, etc. by 30 students (14% of the sample) as a source, whereas no sources were cited for the remaining 57 students (28% of the sample).

Blood Cells that are reduced in Dengue

This figure shows that the test 'NS1' was chosen by 36 students (17% of the sample); the test 'IgM Antibody' was chosen by 13 students (6% of the sample); the test 'IgG Antibody' was chosen by 7 students (3% of the sample); and the test 'All of the above' was chosen by the remaining 150 students (72% of the sample). It indicates that they concur with each test's name.

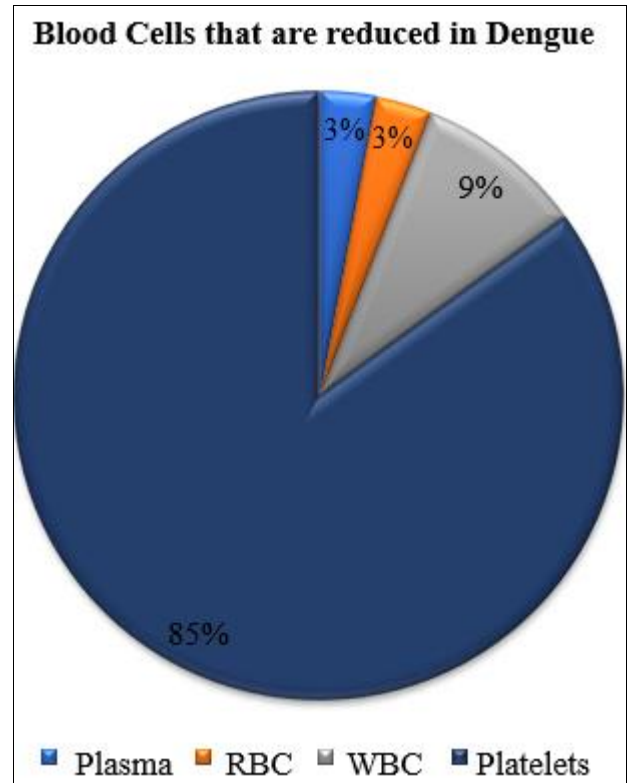


Fig 5: Blood Cells that are reduced in Dengue.

Name of Dengue Tests

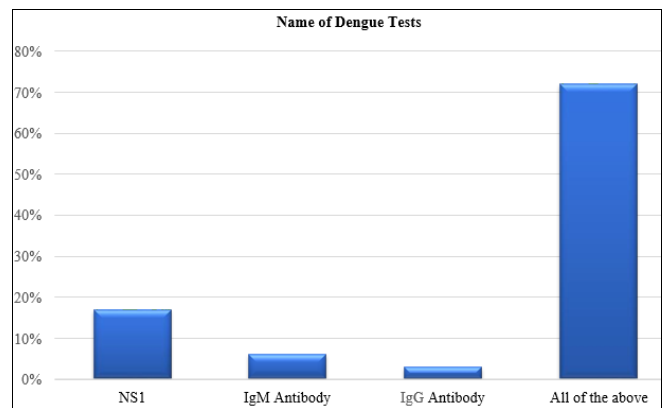


Fig 6: Name of Dengue Tests

Food or Drinks that Increase Blood Platelets

Table 3: Food or Drinks that Increase Blood Platelets

Foods or Drinks	N	Percentage (%)
Coconut water	43	21
Papaya, pumpkin, beetroot, vegetables, pomegranate	35	17
Red meat, lentils, beans, spinach, sea foods	23	11
Other foods or drinks	72	35
N/A	33	16

Dengue Peak Season in Bangladesh

The peak dengue season in Bangladesh is depicted in this image. Here, votes were cast for the following months: 158 students (76% of the sample) for the month of August to October; 13 students (6% of the sample) for the month of October to December; 5 students (2% of the sample) for the

month of January to April; 30 students (14% of the sample) for the month of April to July.

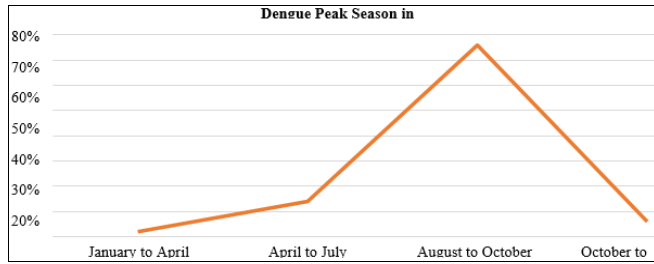


Fig 7: Dengue Peak Season in Bangladesh

The Reason Why Dengue Patients are increasing in Bangladesh

Table 4: The Reason Why Dengue Patients are increasing in Bangladesh

Reasons	N	Percentage (%)
Lack of awareness	34	17
Rapid urbanization, poor housing, overcrowding, inadequate sanitation, uncleaned drainage system, etc.	13	6
High temperature, high humidity, an unusual episodic amount of rainfall, etc.	23	11
Over population, climate change, unconsciousness, etc.	37	18
Other reasons	34	17
N/A	65	31

Areas with Higher rates of Dengue in Bangladesh

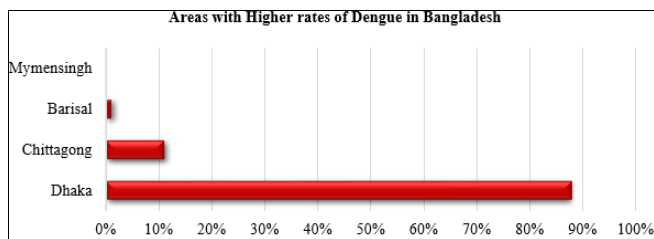


Fig 8: Areas with Higher rates of Dengue in Bangladesh

The regions in Bangladesh where dengue sufferers are highly regarded are depicted in this picture. Out of the sample, 182 students (88%), 22 students (11%), 2 students (1%), and none of the students voted for Mymensingh. The 182 students who voted for Dhaka were the ones who received the most votes.

Knowledge about Dengue Shock Syndrome

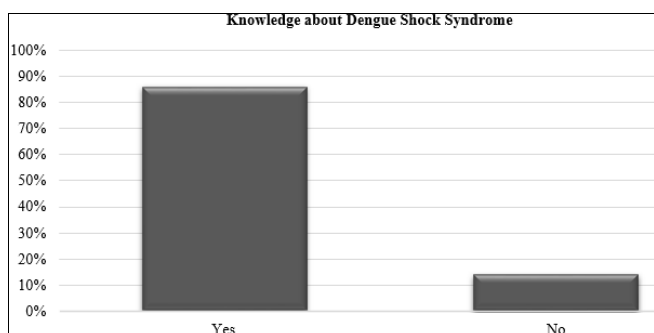


Fig 9: Knowledge about Dengue Shock Syndrome

This diagram illustrates what we know about dengue shock syndrome. Of the students in the study, 86% are aware of dengue shock syndrome, whereas 14% are not.

Steps to Reduce the Spread of Dengue Infection

Table 5: Steps to Reduce the Spread of Dengue Infection

Steps to reduce	N	Percentage (%)
Clean the environment	27	13
Use mosquito net, repellent & wear full sleeve cloths, etc.	42	20
Make individual awareness	26	13
Control mosquitoes inside & outside the home	20	10
Govt. should take some steps	2	1
Reduce mosquito growth	4	2
Other steps	16	8
N/A	69	33

We determined that 27 students, or 13% of the sample, indicated "clean the environment" as a step by looking at the complete table.

Support the Steps taken by the Government to Prevent Dengue

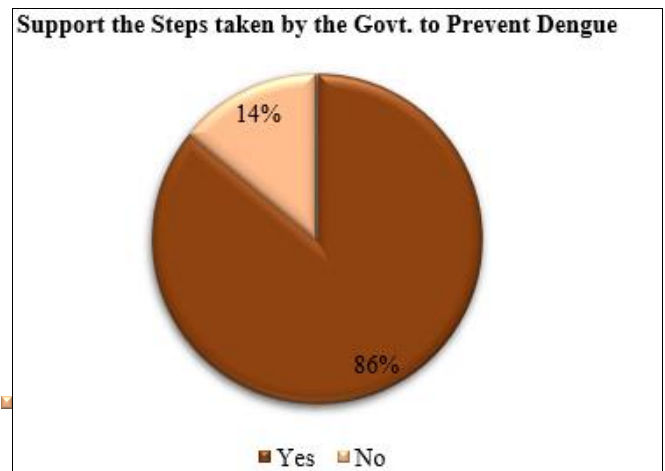


Fig 10: Support the Steps taken by the Government to Prevent Dengue.

Based on the data presented, 86% of the student sample agree with the government's efforts to prevent the dengue virus, while 14% disagree with these measures.

Campaigns that are needed for Dengue Prevention

Table 6: Campaigns that are needed for Dengue Prevention

Campaigns	N	Percentage (%)
Public awareness program	61	30
Workshop about public health	41	20
Seminar about dengue related	20	10
Student campaign	15	7
Blood donation campaign	3	1
Program about cleanliness	6	3
N/A	60	29

Discussion

We exposed the students' age, marital status, and gender in table 1. The age range of the students is 22 to 27 years old, and the majorities are single. Students studying health-related disciplines engaged in and showed greater interest in

this kind of survey than students in other disciplines, as seen in figure 1 shows that although the majority of students are aware of dengue, they are unconcerned about it. We discovered that there were a comparatively large number of dengue cases in figure 2. We found that dengue affects most people, as shown in figure 3. They experienced this illness's repercussions. As such, we must remain extra watchful of it throughout the dengue season. Figure 4 shows that a large number of pupils do not know the difference between *Aedes* and *Aedes aegypti* mosquitoes.

We have identified several dengue mosquito-breeding places in table 2. Knowing this, we may take precautions and warn others to reduce the number of mosquitoes that spawn. Because of mosquito reproduction, the number of dengue cases is increasing every day and needs to be prevented. These sources need to be removed in order to prevent *Aedes* mosquitoes from procreating. We cannot eradicate dengue unless we also destroy its causes. Since most mosquitoes grow in water, we need to make sure there isn't any standing water near the house. Regarding dengue, we need to exercise more prudence. We discovered the names of the blood cells in picture 5. As everyone knows, a normal blood cell counts fifteen to forty-five lakh platelets. A drop in platelets in the blood is one indicator that the patient has dengue fever, which aids in the diagnosis of the condition. A patient experiences severe weakness because of having dengue fever. A few dengue test names were revealed to us in figure 6. Anyone with dengue symptoms can be subjected to these tests. The foods and drinks we can take when we have dengue fever are listed in table 3. Eating these meals can be very beneficial for dengue patients. This diet raises the platelet count in our blood. Beetroot, coconut water, and red meat, for instance, are all very good for the body's blood-forming mechanisms.

The biggest number of students were voted for August to October in this figure 7 because of the dengue mosquito's strong potential for mass infection during this season and tendency for fast reproduction. Therefore, we should be more careful during these months to prevent getting the disease, especially in young people and the elderly. They immediately catch up on the signs of dengue. Throughout this dengue season, the government also exercises special caution. It is advised that more mosquito nets be distributed and that areas with a high density of dengue patients, or the entire country, be thoroughly cleansed.

Figure 8 clearly shows that, out of all the locations in Bangladesh, Dhaka has the highest dengue patient rating. We wish to ascertain whether or not students are familiar with Dengue Shock Syndrome in figure 9. Most pupils are conscious of it. Shock syndrome is killing children more frequently during the dengue season. Table 5 outlines a number of preventative actions that must be implemented to halt the spread of dengue fever cases. We must use repellents, keep our surroundings clean, avoid storing tainted water, and shield ourselves from mosquito bites. The government should provide more and more pesticides. Figure 10 show that in order to prevent the dengue virus from spreading, the government must act. They appear to favour both greater public knowledge and other preventative steps that we may do to lessen the dengue virus. To increase public awareness of this issue, the government should prepare actions. We learned a great deal about awareness campaigns that we could launch to inform people in our

community from table 6. A key component of avoiding dengue fever is public health.

Conclusion

Dengue knowledge, awareness, and prevention are the main topics of this study. The prevalence of dengue is rising in our country. The study's focus is on students who have dengue or who experience the symptoms in themselves or others. Based on the results of this survey, we can infer that pupils in this generation have a considerably greater understanding of dengue. Still, they are not very conscious. In addition, this type of disease strikes us because of our disorganized environment. We need to clean our own dwellings to stop the mosquito from spreading and breeding. In order to prevent individuals from catching the dengue virus, our government also has to organize public health awareness campaigns and show greater care for the dengue virus.

Competing interests

According to the author, there are no conflicting interests.

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