Original Research Article

Comprehensive educational investigation on the perception of biology students on Dengue fever at Colleges of Education in Enugu State, Nigeria

ABSTRACT

Aims: It investigated knowledge of dengue fever among biology students in college of education students in Enugu state.

Methodology: A descriptive survey research design was adopted for the study. The population of the study was 5773 biology students of colleges of education in Enugu state. The sample size of the study was 284 respondents using the Taro Yamani formula and simple random sampling techniques. The questionnaire was used for data collection.

Results: Based on the analysis, the following major findings were made: the students know the five key research questions. From the findings, the following recommendations were made: The inclusion of dengue fever and its prevention and control should be promoted in school and in the College curriculum to raise awareness among students and use them as multipliers. There is an urgent need for massive awareness programs to raise the knowledge of both students and community people in Enugu State. For this social mobilization and communication programs could be developed. Such programs will be crucial to winning community support towards adopting effective measures for preventing dengue fever transmission, improving surveillance and health care-seeking behavior, and better-controlling outbreaks of dengue fever.

Conclusion: The research concluded that Colleges of Education Students in Enugu State displayed a fair knowledge level of dengue fever, the majority of persons had a clear understanding of fever, headache, vomiting, and nausea as general signs and symptoms of dengue viral fever, a huge number of students exhibited vague opinion of other different signs and symptoms. The mosquito time biting and all the preventive measures in controlling dengue fever are not well known by the students.

Keywords: Dengue fever, Investigation, Biology Student, Mosquito, Preventive, infection, Malaria

1. Introduction:

According to the World Health Organization, Dengue is a viral infection caused by the dengue virus (DENV), transmitted to humans through the bite of infected mosquitoes. About half of the world's population is now at risk of dengue with an estimated 100 to 400 million infections occurring each year perhaps dengue is found in tropical and sub-tropical climates worldwide, mostly in urban and semi-urban areas [1]. Around 390 million people develop dengue infections every year [2]. Dengue virus is an RNA virus that belongs to the family Flaviviridae and has four different but closely related serotypes: DEN-1, DEN-2, DEN-3, and DEN-4 [3]. Infection with one serotype provides lifelong immunity for that particular serotype but partial immunity for other serotypes [1],[3]. Dengue infection is a mosquito-borne humid problem due to a virus named the dengue virus. After five to fourteen days of infection, the signs and symptoms appear [4].

The signs and symptoms of dengue fever are joint pain with reddish skin, high fever, and severe headache. Normally patients recover within four to nine days. In the small ratio of patients, the dengue virus infection is commonly called DHF or dengue hemorrhagic fever [5]. Among arboviral infection

diseases, dengue fever is considered to be one of the most common types in the world; with approximately 390 million infected cases yearly and 40% of the world population living in at-risk areas [6]. The mosquito, Aedes Aegypti is the primary vector of dengue fever, and it is a “hydrophiid species”. Therefore, the presence of stagnant water creates perfect breeding sites for the mosquitoes. The factors that contribute to expanding mosquito populations are the rainy season, high humidity, and low temperatures, and these factors play an important role in dengue fever transmission [7]. The fast expansion of the dengue virus is expected to increase based on some factors, such as modern dynamics of climate change, globalization, urbanization, trade and travel, socioeconomic status, viral evolution, ecological disturbance, lack of effective vaccines, and no specific treatment [8].

Furthermore, People have poor knowledge about dengue fever and Aedes aegypti because they differ from mosquitoes. They adopted various preventive measures to escape from mosquito bites only during the night but Aedes mosquitoes will bite only at that time [9]. The secret of national health lies in the homes of the people and the hand’s students [10]. The students would be suitable to access the knowledge regarding dengue fever because they are in the process of forming habits. They should essentially know so that they can help create awareness in reducing the dengue fever outbreak across the college communities. College students are a critical group of learners in a community because they have access to authentic knowledge. The authority can easily reach them through college premises or different social and digital media platforms [11], [12]. If these students bear enough knowledge and positive attitudes, they can transfer it to the community. In collaboration with education biology students in the colleges of education, the community can then translate knowledge and attitudes about dengue fever into preventive practices. Thus, students can act as a crucial hub for community preparedness. Education Biology students are a group of learners of many government-funded public and private colleges of Education. A massive number of these students live inside and outside the school premises. These students have a high dengue fever risk, like other people living in the city. Inadequate school premises and infrastructure can be a hotspot for dengue fever [11]. These students also move across the country for educational and family purposes. As a result, they may act as carriers of the dengue fever virus or as trusted media, disseminating authentic knowledge and preventive attitudes throughout the country.

The increase in the danger of severe complications is due to the alternate type of subsequent infection. Different tests are done to confirm the result which includes antibody recognition to the disease or its nuclei acid [13]. For the immunization process, a vaccine for dengue infection has been accepted and is generally accessible in different countries of the world. Starting in 2018, immunization has just suggested in people who have been recently tainted or in places with a high place of earlier disease by age nine [14]. Different strategies for counteraction incorporate lessening mosquito-usual environments and restricting the bites. This is done by wearing an apparel dress that covers greater parts of the body and covering or disposing of the stagnant water. For treatment of mild to moderate dengue infection, it includes giving liquid either intravenously or through mouth [4]. Blood transfusion is the only way of treatment that is performed for more severe cases of dengue infection. A large number of people require medical clinic affirmation [15] paracetamol (acetaminophen) is suggested rather than no steroidal drugs for relief of discomfort or decreasing fever due to the danger of bleeding chances increases due to the large use of NSAIDs [16].

2. MATERIAL AND METHODS

2.1 Area of Study

The research was conducted in Enugu State, focusing on seven Colleges of Education: Federal College of Education, Eha-Amufu, Enugu State College of Education Technical, Enugu, Peace Land College of Education, Enugu, Institute of ecumenical education Enugu, African thinkers community of inquiry college of education Enugu, Our savior institute of science, agriculture and technology college of education Enugu and The College of Education Nsukka. The College of Education Nsukka and Our Savior Institute of Science, Agriculture, and Technology College of Education Enugu were excluded from the study as it does not offer Education in Biology. Hence, the Federal College of Education, Eha-Amufu, and the College of Education Technical, Enugu were chosen for the study due to their Education Biology programs for both N.C.E. and Degree students.

2.2 Research design, the population of the study, sample, and sampling techniques

This study adopted a descriptive survey design and the reason for this choice was because the study is aimed at collecting data from students considered representative of the population in assessing students' knowledge level of diarrhea. The population of the study comprised five thousand, seven hundred and seventy-three (5,773 – total population of all students in the two selected colleges of education). The Federal College of Education, Eha-Amufu has a total number of six hundred and forty-five (645) Education Biology students (Nigerian Certificate in Education – 316 & Degree – 329) while Enugu State College of Education Technical has a total of three hundred thirty-six (336) Education Biology students (Nigerian Certificate in Education – 154 & Degree – 182. Both Colleges have a total of 981 Education Biology students. We chose Nigerian Certificate in Education II, Degree II, and Degree III students for this study because they have encountered topics such as "Pollution, Sanitation & Personal Hygiene and Disease" in their previous classes. The sample size of 284 was derived using Taro Yamen's formula:

$$n = \frac{N}{1 + N(e)2}$$

Where:
n = Sample size -?
N = Population of the study – 981
e = Level of significance – 0.05;
1 = Theoretical constant – 1.

Substituting the values in the formula:

$$= \frac{981}{1 + 981(0.05)2} \quad = 284$$

The instrument for data collection was a questionnaire. Questionnaire items were constructed to afford an answer to the research questions formulated to guide the study. The questionnaire consists of five sections. Section A sought information on the causes of Dengue fever, Section B sought information on the signs and symptoms of dengue fever, Section C sought information on the breeding site of the dengue vector, Section D sought information on mosquito biting time, while Section E sought information on attitudes towards dengue fever prevention. Four-point scale rating of Strong Disagree (SD), Disagree (D), Agree (A), and Strong Agree (SA) with values of 1, 2, 3, and 4.

2.2 Validity of the instrument

The research instrument was subjected to face validation by giving it to an expert from Measurement and Evaluation and another from Biology Education, all in the Federal College of Education, Eha-Amufu. They were asked to validate the instrument concerning the appropriateness of language used in terms of clarity of statement and adequacy of items of the instrument. The experts also checked whether the instrument was capable of answering the questions. Based on the experts, corrections, comments, observations, suggestions, and amendments were made to the instruments before a final copy was produced for the study.

2.3 Method of Data Analysis

The data collected from the respondents were keyed into a Microsoft Excel sheet, and analyses of mean and standard deviation were carried out. A four-point scale of Strong Disagree (SD), Disagree (D), Agree (A), and Strong Agree (SA). The scaling statement and the nominal values are SD= 1; D= 2; A= 3; and SA= 4. Therefore, mean = 4+3+2+1 divided by 4 = 2.50. Therefore, 2.50 was the cut-off point for deciding on each item. Any item whose weighted mean was 2.50 and above was considered as agreement while any item that was less than 2.50 was regarded as disagreement.

3. Results

The presentation and analysis of data obtained from the Administration of the instrument (questionnaire) of the study. The data were organized into five tables in relevance to the five research.

3.1 Causes of dengue fever

Table 1 revealed that the majority of the students responded that Dengue is caused by the four dengue viruses, DENV-1, DENV-2, DENV-3 is dengue virus and DENV-4, and Bite of female Anopheles mosquito causes malaria. The table also showed that some of the students disagreed that the bite of female Aedes aegypti causes dengue and that dengue spread rapidly because of climate change, rapid urbanization, and population growth. Similarly, the standard deviations of all items are relatively high (≥ 0.5 ≤ 1) which implies that the individual responses deviated from the mean.

3.2 Common symptoms of dengue fever

Table 2 shows that the majority of the students responded that common symptoms of dengue fever include, fever, headache, and vomiting/nausea. The table also shows that some of the students disagreed that they did not know the difference between the symptoms of malaria and dengue fever. Similarly, the standard deviations of all items are relatively high (≥ 0.5 ≤ 1) which implies that the individual responses deviated from the mean.

3.3 Common breeding site of dengue vector

Table 3 shows that the majority of the students responded that stagnated water, refrigerated trays, water storage tanks, and discarded tires are common breeding sites of dengue vectors. The table also shows that few of the students believed that nonfunctioning cisterns and squatting pans of toilets a common breeding sites of dengue vectors. Similarly, the standard deviations of all items are relatively high (≥ 0.5≤1) which implies that the individual responses deviated from the mean.

Table 1: Causes of dengue fever

S/N	ITEMS	X	SD	REMARKS
1	Dengue is caused by the four-dengue virus	2.97	1.10	Accepted
2	DENV-1, DENV-2, DENV-3 and DENV-4 are not dengue viruses	2.83	0.95	Accepted
3	Bite of female Aedes aegypti causes dengue fever	2.39	1.12	Rejected
4	Bite of female Anopheles mosquito causes malaria	2.89	1.12	Accepted
5	Dengue spread rapidly because of climate change, Rapid urbanization and population growth	2.44	0.92	Rejected
	Total	13.52	Grand mean	2.70

Table 2: Common symptoms of dengue fever.

S/N	ITEMS	X	SD	REMARKS
1	Do you know the difference between symptoms of malaria and dengue fever?	2.42	1.15	Rejected

2	Fever	2.68	1.10	Accepted
3	Headache	3.13	1.03	Accepted
4	Bleeding	2.24	1.00	Rejected
5	Vomiting/Nausea	2.82	1.10	Accepted
Total sum		13.29	Grand mean	2.66

Table 3: Common breeding site of dengue vector.

S/N	ITEMS	X	SD	REMARKS
1	Stagnated water	2.79	0.88	Accepted
2	Refrigerator trays	2.84	1.00	Accepted
3	Water storage tanks	3.20	1.10	Accepted
4	Nonfunctioning cisterns and squatting pans of toilets.	2.02	1.04	Rejected
5	Discarded tires	2.80	1.11	Accepted
Total sum		13.65	Grand mean	2.73

3.4 Frequent mosquito time biting

Table 4 revealed that the majority of the students responded that sunset is the frequent mosquito time biting. The majority also showed that majority disagreed that sunrise is the frequent mosquito time biting. Similarly, the standard deviations of all items are relatively high (≥0.5 ≤ 1) which implies that the individual responses deviated from the mean.

3.5 Attitudes towards dengue fever prevention

Table 5 indicated that the majority of the students disagreed with the questions which stated that overall attitude and willingness to use personal prophylactic measures against mosquito bites are the attitudes towards dengue fever prevention. The table also shows that the majority of the students accepted that overall knowledge and willingness to prevent stagnation of water are the attitudes towards dengue prevention. Similarly, the standard deviations of all items are relatively high (≥0.5 ≤ 1) which implies that the individual responses deviated from the mean.

Table 4: Frequent mosquito time biting.

S/N	ITEMS	X	SD	REMARKS
1	Sunset	2.74	1.15	Accepted
2	Sunrise	2.15	0.90	Rejected
Total mean score		4.89	Grand mean	2.45

Table 5: Attitudes towards dengue fever prevention.

S/N	ITEMS	X	SD	REMARKS
1	Willingness to use personal prophylactic measures against mosquito bites.	2.23	0.99	Rejected
2	Willingness to prevent stagnation of water	2.83	0.97	Accepted
3	Overall attitude	2.35	1.14	Rejected
4	Overall knowledge	2.86	1.12	Accepted
Total mean score		10.27	Grand mean	2.57

4. Discussion

The research conducted on students from Colleges of Education in Enugu State has revealed a remarkable depth of knowledge regarding the causes of Dengue fever which is caused by the four-dengue virus, DENV-1, DENV-2, DENV-3 and DENV-4, and Bite of female Anopheles mosquito causes malaria. Dengue fever is caused by four serotypes of the dengue virus (DENV-1, DENV-2, DENV-3, and DENV-4), which are transmitted to humans by the bite of an infected Aedes mosquito, particularly Aedes aegypti which is the primary vector for the virus [1], [3]. The virus replicates in the mosquito's gut and then migrates to its salivary glands, where it can be transmitted to a new host. It is important to note that the dengue virus is not contagious and cannot be transmitted from person to person. This means that a person with dengue fever cannot transmit the virus to another person through contact, such as coughing or sneezing. The only way to contract the virus is through the bite of an infected mosquito. Regarding the Common symptoms of dengue fever, the student's responses were comprehensive. Common symptoms of dengue fever include fever, headache, and vomiting/nausea while some don't know that bleeding is one of the common symptoms of dengue fever. The common symptoms of dengue fever include the onset of fever, severe headache, fatigue, nausea, vomiting, and mild bleeding, such as nose or gum bleeding. In some cases, patients with dengue fever may develop a more severe form of the disease, known as dengue hemorrhagic fever (DHF) or dengue shock syndrome (DSS), [17]. Also, to support the above findings, in 2020, a study conducted in Malaysia found that the most common symptoms of dengue fever were fever (100%), headache (84.8%), fatigue (80.4%), and nausea/vomiting (69.4%). The study also found that patients with severe fever had a higher frequency of symptoms such as abdominal pain, bleeding, and shortness of breath. The study shed light on Common breeding sites of dengue vectors. Stagnated water, refrigerated trays, water storage tanks, and discarded tires are common breeding sites of dengue vectors which are comparable to the findings of [12]. More so, it's important to note that Aedes aegypti mosquitoes breed in stagnant water, particularly in urban and suburban areas. The research demonstrated the deficiency of knowledge regarding attributes of dengue infection especially the Aedes mosquito bite time as most of the students thought that dengue mosquito bites in the day or at night time only. Surprisingly, more than half of the students were unaware that dengue mosquitoes are more likely to bite in the afternoon; instead, they reported night as the mosquito's biting time. Meanwhile [18], pointed out that Aedes Mosquito usually bites during the day. These mosquitoes are more active during the day and particularly active during early morning and late afternoon. A study conducted in Brazil also found that the peak biting activity occurred during the early morning and late afternoon periods, between 6:00-8:00 am and 4:00-6:00 pm. Attitudes towards dengue prevention in the study reveal that most of the students are aware that willingness to remove stagnant water, overall knowledge, and reduce contact with mosquitoes are necessary for to prevention of the dengue virus. Most of them showed poor practice in participating in the use of personal prophylactic measures against mosquito bites. This is similar to the findings of [19] which state that respondents had good knowledge regarding dengue prevention, causes,

and symptoms but that there's still a need for increased awareness about the importance of personal protective measures in preventing dengue fever occurrence.

4.1 Conclusion

College of Education Students in Enugu State displayed a fair level of knowledge regarding the causes of dengue fever, The majority of persons had a clear understanding of fever, headache, and vomiting/nausea as general signs and symptoms of dengue viral fever, and huge proportion exhibited vague opinion of other different signs and symptoms such as bleeding. The mosquito time biting and all the preventive measures in controlling dengue fever are not well known by the respondents.

4.2 Implications of the study

There is a need for educational programmes adapting transformational learning and strategies by Colleges of Education such as developing students friendly and continuous information regarding dengue fever as part of health promotion strategies and the need for a holistic approach, community participation, and cooperation are important to impart knowledge and foster good practices in the prevention and controlling of dengue not only in the campus but trigger good practice among the community in general.

Consent

Not applicable.

Ethical approval

Not applicable.

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