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Effect of Educational Interventions on Awareness of Dengue Fever and Its Preventive Measures among High School Students

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ABSTRACT

Dengue fever was a communicable disease transmitted through a vector borne means. Dengue fever was also known as break bone fever and clinical manifestation in the form of headache, nausea, vomiting, and fever, joint and muscular pain occurred more frequently in patients. **Objective:** To improve the awareness on dengue fever and its preventive measures among high school student. **Methods:** A quasi- experimental (pre-test, post-test) study design was used. The duration of the study was six months, and a convenient sampling technique was used to collect data from high school students. The sample size of the current study was 36 and data were collected through adopted questionnaire. **Results:** 58.3% of study participants belong to 9thclass while remaining were from 10th (41.7 %.). As per age brackets, 38.8% students were belong to 15years of age, the 16 years age students were 33% while only 5% comes under the age of 18 years. The pre intervention mean awareness score was 7.13±1.41 while the post test enhancement in awareness score was 13.69 ±3.02. There was a statistically significant difference between pre and post intervention awareness score after the health education session. **Conclusions:** The findings of present study suggested that awareness of students was enhanced after educational interventions. Their awareness had been improved about the causative agent, sign/symptoms, mode of transmission, mechanism of infection etc. after educational session. Moreover, the participant's awareness improved about preventive measures of dengue control likely environmental control (spraying and fogging) and personal protection after educational program. Educational programs help to change the attitude and behavior of the participants towards control measures.

INTRODUCTION

Every person has the right to live healthy life. It is the global concern to provide quality life to individual. There are two main health related concerns namely communicable and non communicable. Communicable diseases are illnesses which can be transmitted from one person to another person by direct/indirect contact, airborne transmission, and vector borne transmission, food and water borne transmission [1]. While, the Non communicable diseases are condition that cannot be transferred from one person to other through contact. They are chronic in nature and caused by multiple factors. Dengue fever is a communicable disease transmitted through a vector borne means. The word dengue was derived from a Swahili phrase having meaning of cramp like seizure [2, 3]. Dengue fever, an infectious disease which is spread to the humans by the bite of infected mosquitos' name Aedes Egypt and Aedes albopictus. Dengue fever regarded as one of the major viral illness of this modern era. Dengue virus belongs to Flaviviridae family and is caused by an infected mosquito [4]. Dengue fever is also known as break bone fever and

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clinical manifestation in the form of headache, nausea, vomiting, fever, joint and muscular pain occurred more frequently in patients. The morbidity and mortality rate from severe form of dengue fever increased annually [5]. The death rate from dengue could be minimized by giving awareness to the patients and general public about this disease and it's preventing measures [6]. Over the past few decades, dengue fever prevalence has increased worldwide. The increase in the occurrence of dengue fever could potentially affect half of the world's population. Dengue fever is currently prevalent to 110 countries worldwide and is a tropical illness. An estimated 3 billion people are susceptible to dengue fever, of which 70–500 million are diseased and 20,000 die from the dengue fever each year [1, 7, 8].Lack of adequate information about wide range of sign/symptoms of dengue fever lead to wrong classification and inaccurate diagnosis worsened the case lead to high mortality rate. Moreover, dengue cases may be underreported in Pakistan [9]. Dengue fever is influenced by number of factors like huge population growth, poor waste management, and urbanization, ponds formation in rainy session and ineffective preventive measure of breading points of mosquitoes [10-12]. The most widely used strategy for the prevention and control of dengue spread among general public is the vector control. The vector control measure can be mainly created outside by intermittent fogging of prevalent areas. While the mosquitoes of dengue fever are difficult to kill by insecticide as Aedes aegypti remains in the hidden indoors, therefore exacerbating the severity of illness [13]. Effective preventive measures play an important role in the eradication of dengue fever. There should be a need to eliminate the breading points of mosquitoes both at indoor and outdoor places. The behavior of human plays a significant role in the creation of breading points and supporting the increase in mosquito's' growth [14]. The production of mosquitoes can be controlled through the utilization of effective preventive measures for example, improvement in sanitation system of public and homes, proper waste disposal, good and concealed water supply chain, and changes in the people behavior to minimize the breading sites of dengue [15, 16]. The critical challenge for preventing the outbreaks of dengue in different tropical countries is the favorable temperature for the breeding of mosquitoes [17]. The humid, slightly hot temperature favors the replication of dengue viral around the year. Vector control strategies should be devised by local government or municipal corporations to prevent the break of dengue epidemic. The municipality is accountable for controlling the vector by eradicating the breading places through the use of insecticides [15, 18, 19]. The insecticides kill the larva and adult mosquitoes to suppress the mosquito vector activity and minimize the episodes of dengue fever among susceptible population [20, 21]. Dengue fever remains a significant public health concern in rural areas of Bahawalpur, where environmental factors such as fertile land near the River Sutlej, hot and humid climate, and inadequate waste disposal create ideal conditions for Aedes mosquito breeding. Limited healthcare access and a lack of awareness further exacerbate the impact of dengue, leading to frequent outbreaks that compromise the health, education, and livelihoods of affected individuals. High school students represent an ideal group for targeted educational interventions due to their capacity to learn, retain, and disseminate knowledge within their families and communities. By empowering students with accurate information about dengue fever and its preventive measures, they can play a pivotal role in reducing disease transmission. Engaging students as change agents not only helps to raise awareness among the wider population but also instills lifelong preventive habits that contribute to long-term vector control and disease reduction.

Therefore, the purpose of this study was to improve the awareness by educational interventions on dengue fever and its preventive measures among high school student.

METHODS

A quasi- experimental one group (pre-test, post-test) study design was used to assess the awareness of students about dengue fever and its preventive measures before and after the educational interventions. The study was conducted among high school students, rural community of Bahawalpur, Pakistan. The target population was the school students of 9th and 10th class and included in study. All the participants who didn't give consent were excluded from study. Informed consent was diligently obtained from both parents and guardians as well as the students participating in the study. Prior to securing their consent, a comprehensive explanation was provided of the study's aims and objectives, ensuring that the students fully understood the purpose, procedures, and potential implications of their involvement. This thorough communication was essential to facilitate an informed decision regarding their participation in the research. The selection of school students as study participants for present study was a strategic approach for the prevention and control of disease spread. As students were the vulnerable age groups and at risk due to the exposure of mosquitoes in the playgrounds and class rooms. Educational interventions empower the students as a change agent that influences the families and communities to take on the measures to control the breeding places of mosquitoes. Moreover, students will share knowledge with other members of the family, cheering the awareness and participation in the initiatives

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of community-based prevention of dengue. This approach was cost effective and promotes healthy and well informed community. The duration of the study was six month from November, 2023 to April, 2024. A convenient sampling technique was used to gather data from study participants. There were 200 students in 9th and 10th class at study setting. Cochran formula was used to calculate sample size by taking margin of error (e) 0.15, an estimated proportion of population (p) 0.5, population of 200, and Z(a/2) score from the Z table at 95% confidence interval which was 1.96. The final sample size, based on limited population was calculated to be 61 participants.

$$n = \frac{n_o}{1 + \frac{(n_o - 1)}{N}}$$

Here n0 was Cochran's sample size recommendation, N was the population size, and n was the new, adjusted sample size i.e. 36. While the students on leave and having understanding or hearing issues were excluded. Data were collected after taking permission from college management and school administration. Research has explained the purpose and aim of the study. Study participants were informed about the details of educational interventions and shared with them. Power point presentation, charts, role plays and demonstration were the teaching strategies used to convey the information the students about dengue and its preventive measures. All the data were recorded on a predesigned Performa. Student's awareness about dengue fever was assessed by short test, which includes questions about dengue and its preventive measures. Total 20 questions were asked. Each correct answer was scored as 1 and wrong as 0. Highest score indicates good awareness. Data were gathered at two point of time. The structured questionnaire was distributed/filled by students before start of the study and after 6 weeks of educational interventions. Data were analyzed by SPSS (Version-22.0) and paired sample t-test utilized to find out the improvement in the awareness of students about dengue fever and its preventive measures. The normality of data was checked by Shapiro wilk test and paired sample t- test was used to see difference among means on awareness of students about dengue fever and its preventive measures before and after the educational interventions. Moreover, the statistics of paired sample t-test depicted the improvement in the awareness level of students.

RESULTS

The demographic characteristics of study participants deal with the distribution of students according to age, gender and grades. The data were summarized in terms of frequency and percentage. Table 1 depicted the demographic data of the students as 58.3% of study participants belong to 9th class while remaining were from 10th (41.7 %). As per age brackets, 38.8% students were belonging to 15 years of age, the 16 years' age students were 33% while only 5% comes under the age of 18 years.

Table 1: Demographics of study Participants

Variables	Years	Frequency (%)
Age	15	14 (38.8%)
	16	12 (33.5%)
	17	8 (22.2%)
	18	2 (5.5%)
Gender		36 (100%)
Grades	9^{th}	21 (58.3%)
	10^{th}	15 (41.7%)

Table 2 displayed the values of average mean before and after the educational interventions among high school students. The pre intervention mean awareness score was 7.13 ± 1.41 while the post test enhancement in awareness was 13.69 ± 3.02. There was statistically significant difference between pre and post intervention awareness score.

Table 2: Pre and Post Interventional Mean Awareness Score

Awareness Score	Mean ± SD	p-Value
Pre Knowledge Score	7.13 ± 1.417	0.00
Post Knowledge Score	13.69 ± 3.02	

DISCUSSION

The aim of this study was to enhance the awareness on school students about the dengue fever and its preventive measures. The educational sessions plays an important role in enhancing the awareness and become a basis for preventive measures to control dengue outbreak. The present study results showed that all participants were male and majority was younger than 18 years. As per age brackets, 38.8% students belong to 15 years of age, the 16 years age students were 33% while only 5% comes under the age of 18 years. The finding of previous study was similar and majority of the students fall in the age bracket of 15 and 16 years [18]. According to the findings of the present study, the major information source of dengue fever was the media and health education. Media like TV, radio, audio visual information on social media disseminate important information about dengue fever and preventive measure among general public. These findings were consistent with one of the previous study results, where students were in touch with friends and the print media. But, media especially audio-visual were accessible to the students for quality education and facilitate to take precautionary measure to control the vector transmission of dengue [14, 22]. The present study results depict that majority study subjects have poor awareness before intervention about the dengue and its preventive measures but after intervention there awareness level increases and proves the effect of educational intervention. Similar

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results of a study conducted by Namirimu and Kim (2024), revealed that educational intervention enhances knowledge about dengue fever and the history of transmission by the mosquito's name Aedes aegypti was the first vector of dengue illness which was transmitted to human beings by the bite of infected mosquitoes [23]. Moreover, the students in current study were fully aware that rainy, humid season as compare to summer /winter was a favorable season for the breading of dengue mosquitoes. These findings were supported by a study conducted in Malaysia about the effect of awareness education on dengue fever knowledge and the best season of mosquito breeding. The participants of this previous study knew the favorable season of dengue breading was moon soon weather [18, 24]. The participants of current study give positive responses to the sign and symptoms of dengue fever. They stated that nausea, vomiting, purple bruises followed by fever were the common symptoms of dengue fever. This was supported by the previous study data which was contrary to the current study result. According to previous study, majority subjects were not identified the symptoms of dengue fever correctly. The sign and symptoms of dengue fever ranges from abdominal problems to headache, body aches, bruises accompanied by fever [25]. As the results of current study presented that majority of the students become familiar about the breading places of dengue mosquitoes after attending educational session about dengue. Students become aware that accumulation of water either in rainy season or by manmade ponds was the breading place of mosquitos' production. One of the previous studies supports these study outcomes as humans were responsible for making watery breading places in or outside the home especially in factories and construction site [26, 27]. The respondents of the present study demonstrated a positive affirmation regarding preferred treatment places for dengue fever, highlighting government hospitals and dispensaries as essential facilities for providing quality care to patients, both temporarily and on an in-patient basis. Previous studies have suggested that government hospitals possess adequate resources to manage dengue signs and symptoms effectively during outbreaks. However, educational interventions were crucial to addressing gaps in awareness and guiding the community toward utilizing these resources efficiently, ensuring timely and appropriate care during dengue outbreaks [28, 29].

CONCLUSIONS

The findings of present study suggested that awareness of students was enhanced after attending the educational interventions on dengue fever and its preventive measures. Educational programs plays significant role in enhancing the awareness and skills of students about mosquitoes control. The findings indicated a significant improvement in school students' understanding of dengue-related topics following the educational session. Additionally, the educational intervention increased participants' awareness of preventive measures, including environmental control strategies such as spraying and fogging, as well as personal protection methods.

Authors Contribution

Conceptualization: FA
Methodology: RB, DYM, UH, AF
Formal analysis: ILD
Writing, review and editing: SA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

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