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Knowledge and Practice of Nurses Regarding Dengue Fever and Its Prevention in District Swat

Nasar Khan[1], Hafiz Ghufran Ullah[2], Muhammad Kashif[2], Muhammad Zeeshan[3], Wasim Muhammad[4]
[1]Royal college of Nursing, Khyber Medical University, Peshawar, Pakistan.
[2]Institute of Nursing Sciences, Khyber Medical University, Peshawar, Pakistan.
[3]Department of Biochemistry, University of Malakand, Lower Dir, Pakistan
[4]Centre for Omic Sciences, Islamia College University, Peshawar, Pakistan.
Corresponding Author*: Wasim Muhammad (wasimkmu@gmail.com)

ABSTRACT
Background: Dengue fever is a tropical disease that is carried by mosquitoes and is caused by the dengue virus. Dengue fever has an incubation period of three to fifteen days. It can harm the brain, heart, kidneys, liver, or other organs. The most frequent vector used to spread dengue viruses is *Aedes aegypti*. While there isn't a certain antiviral treatment, prompt hydration and electrolyte replacement therapy is advised. The aim of this research is to evaluate the dengue illness prevention behaviors and knowledge of nurses in the district of Swat.
Methods: At the Saidu Teaching Hospital in Swat, this descriptive cross-sectional study was carried out from April 1 to August 31, 2022. The nurses were given questionnaires to complete, and the interviews and answers were documented on a closed-ended questionnaire in order to gather data. It asked questions on age, education, length of service, and nurses' knowledge, attitudes, and practices around dengue disease and prevention.
Results: The Saidu Teaching Hospitals in Swat were the study's location. Ninety nurses were surveyed in order to gauge their understanding of dengue illness and how to avoid it. The research participants' demographic details were documented. Men made up 25% of the research sample's nursing staff, while women made up 75%. The age range of the majority of participants was 18 to 38 years old. A little over 61% of participants held nursing diplomas. This research assesses nurses' proficiency and understanding of dengue fever prevention.
Conclusion: The majority of participants know what dengue fever is. There is a significant dearth of understanding regarding the prevention and transmission of dengue fever. The participants had a thorough understanding of dengue fever, including its main signs and severity of sickness. Few people were misinformed about biting times and vector identification, and the majority took a proactive stance and actively used preventative measures.
Keywords: Knowledge, Practice, Prevention, Dengue fever.

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INTRODUCTION

Dengue fever is a tropical disease that is carried by mosquitoes and is caused by the dengue virus. Any one of the four serotypes including DEN1, DEN2, DEN3, and DEN4 can cause dengue fever or its more severe variant, dengue hemorrhagic fever.[1] One serotype infection results in lifetime immunity to that serotype but only partial protection to other serotypes. Dengue fever has an incubation period of three to fifteen days. The infection may not show any symptoms in cases of less severe forms like dengue shock syndrome or dengue hemorrhagic fever.[2] It can harm the brain, heart, kidneys, liver, or other organs. Antiviral medication is not conclusively effective, and prompt fluid and electrolyte replacement therapy is advised instead.[3] The most prevalent vector for dengue virus transmission is *Aedes aegypti*; *Aedes albopictus*, which feeds on a variety of vertebrate species, is the second and less efficient vector. Approximately 50% of the world's population currently lives in places where dengue might spread due to favorable environmental conditions.[4, 5]

Two variables that contribute to the dengue virus's proliferation are inadequate prophylactic measures and a lack of public awareness of the illness.[6] Dengue prevalence and dissemination are influenced by a number of factors, such as unrestrained population growth, urbanization, deterioration of waste management systems, and inadequate vector control. Because there are limited water sources, water storage techniques are also considered to be a major contributing factor to dengue outbreaks. Moreover, poor dengue control has been connected to poverty, illiteracy, and socioeconomic inequality.[7]

Break-bone fever is a term used to describe the combination of fever, headache, stomach discomfort, rash, muscular pains, and pain in the eyes caused by dengue infection. Multiple dengue serotype infections enhance the risk of hemorrhagic disease, which can result in severe bleeding from the mucosa and gastrointestinal tract, petechial skin hemorrhage, hepatomegaly, circulatory abnormalities, hypovolemia, and perhaps even death.[1, 8] According to the WHO's 1997 dengue guideline, the clinical manifestations of a dengue fever infection can range from classical dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS) to mild-acute undifferentiated febrile disease.[9] The symptoms of DF, an acute febrile sickness, include headaches, leukopenia, rash,

and pains in the muscles, joints, and bones. The four main clinical signs of DHF are hepatomegaly, high fever, bleeding, and, in extreme situations, circulatory collapse.[10] A significant amount of plasma leakage may cause hypovolemic shock in some of the affected people. There have been reports that some chronic illnesses influence DHF and more severe types of dengue. The establishment of DHF and the global comeback of epidemic DF in recent decades have been caused by the geographic dispersal of both vectors and DENVs, making some metropolitan human populations in the tropics hyper-endemic.[11]

Dengue virus infections are found across the world in tropical and subtropical regions. It is becoming recognized as one of the world's emerging infectious illnesses and a serious worldwide public health concern. Globally, dengue fever has been increasingly prevalent in recent decades; according to WHO estimates, 2.5 billion individuals are at risk of getting the illness.[12] The actual number of dengue cases has been mis-classified and underestimated. A recent estimate puts the yearly number of dengue infections at 390 million, of which 96 million result in clinical symptoms such dengue fever, dengue hemorrhagic fever, and dengue shock syndrome—all of which the World Health Organization has classed as illnesses.[13] An early warning system prototype for dengue was developed three months before to the 2014 World Cup in Brazil. It produced probabilistic dengue risk estimates for over 550 "micro regions." The early warnings were disseminated to both Brazilian visitors and the general population.[14] An review of this technique suggests that public health services might benefit from an early warning model framework to control potentially explosive dengue outbreaks, not just ahead of mass gatherings but also before the yearly peak dengue season.[15]

Improving patient outcomes depends on doctors having a thorough understanding of how to handle suspected dengue cases. The World Health Organization (WHO) revised its dengue severity ranking system.[16] The new program's main goal is to enhance clinical outcomes by identifying individuals who are most likely to die and may benefit from therapeutic measures. Nevertheless, since their release, opinions on the usefulness of each classification scheme have continued to differ, and acceptability and implementation of these suggestions have changed significantly. Promising new research has been done on the WHO Dengue Guidelines.[16] For the purpose of early diagnosis and illness prevention, health care workers' knowledge, attitudes, and behaviors about the condition are crucial, particularly those of family doctors who are frequently the initial point of contact for patients.[17-19]

Khan *et al.,* (2019) used a semi-structured, pre-tested questionnaire to collect data on medical students' attitudes and knowledge of dengue disease in a cross-sectional research. Just 21% of the respondents were aware that Aedes mosquitoes are the dengue vector, and 35% of them correctly identified that Aedes breeds in clean water pots.[20] Of the students, 100% recognized fever as the main symptom, followed by bleeding (49%), and joint and muscle soreness (39%). Mosquito nets (100 percent affirmative responses) were shown to be the most effective preventative strategy in a multiple-choice test, with water pot covers (55 percent positive responses) coming in second.[21]

Vector management is the sole method of preventive available for dengue, as there is presently no viable vaccine. According to published research, community people typically have a high level of awareness of dengue sickness, despite their impression of the disease's risk being substantially lower. We talked about awareness at Saidu Teaching Hospital Swat and looked into the possibility of future illnesses. Population density, human behavior, and the socio-demographic setting were taken into consideration while examining the absence of preventative measures and illness treatment. The purpose of this study was to assess patient knowledge, attitudes, and practices related to preventing dengue illness. In addition, to talk about the causes of dengue fever epidemics in Swat as well as awareness-raising and preventative strategies.

METHODS AND MATERIALS

The study was conducted in Saidu Teaching Hospital Swat among the staff nurses. In this cross-sectional study, the research population was the nurses of Saidu Teaching Hospital Swat (n=90). Saidu Teaching Hospital Swat is a tertiary care hospital that provides healthcare facilities to approximately the population of Saidu Sharif, District Swat, Shangla, Kohistan, and other adjacent areas of KPK. A questionnaire was used for data collection.

Registered nurses working in Saidu Teaching Hospital Swat who are willing to participate were enrolled in the study. Above 40 years of age of nurses were excluded from the study, and those who were not interested in participating. Permission for data collection was taken from the hospital MS and NS of Saidu Teaching Hospital Swat. The autonomy of participants was ensured through informed consent. Volunteer participation in research projects has ensured the right to liberty to withdraw at any stage. Participant confidentiality and anonymity were maintained throughout the research project. An informed consent was attached to each questionnaire. About 90 nurses responded to the questionnaire, and due to limitations, we were not allowed time to conduct the survey. We used a quantitative, descriptive study to determine the level of knowledge and practices of nurses regarding the use of PPE in different hospitals in Swat. Quantitative research design is considered as an approved process to evaluate variables test the primary relationship between them, and determine the cause-and-effect relations among variables.[22] The descriptive

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approach provides information regarding different variable relationships.

The key findings of data gathering and analysis are shown in the form of tables, graphs, pie charts, and bar charts. Key findings and data were analyzed to determine nurses' knowledge and practices regarding the dengue virus at different hospitals in Swat. The Statistical package (IBM SPSS) was used to analyze the data. The collected data was first transferred to an Excel spreadsheet that was prepared for the secondary analysis with the help of SPSS software. Data will be analyzed statistically using simple statistical tools like ratios, averages percentages, etc.

RESULTS

In this section, we collected respondent (nurses) information, which consists of four questions regarding gender, age, Service duration, Education, and diploma. The majority of the participants who completed the questionnaire were male, about 77.77%, compared to female participants (22.23%). The largest age group that completed the questionnaire was 18-22 years (33%), followed by age group 23-27 years old (23%) and age group 28-33 years (27%), lastly, >34 years of age were (15%) illustrated in Table 4.1.

Table 4.1 Demographic data of participants

Age	Numbers	Percentage
18-22	30	33%
23-27	21	23%
28-33	25	27%
34-38	14	15%
Gender		
Male	70	77.77%
Female	20	22.23%
Service Duration		
2 months	24	26%
2 years	26	29%
3 years	18	21%
4 years	22	24%
Education		
Diploma nurse	55	61%
BSN	15	16%
Post-RN	20	23%

In this section, respondent was asked different questions for the assessment of their knowledge regarding the importance of the knowledge of dengue fevers. The descriptive statistics show that out of 90 participants, 55 (61%) reported that they have symptoms of dengue fever, and about 75 (83%) participants knew about the transmission of dengue fever, only 50 (55%) of the participants knew about the types of mosquitoes which transmit the dengue fever, 81 participants knew that there is no vaccine for dengue, and only 64 participants take medicine after the exposure (Table 2).

The data showed that 61% of the participants were aware about symptoms of dengue fever. The question on the nurse's knowledge regarding awareness about the minor symptom of dengue fever, 61% reported that, they have enough basic knowledge regrading dengue fever while other 39% reported, they do not have any sufficient medical knowledge as described in Figure 1. The patients having minor symptoms of dengue fever was obtained (61%) with hair drops, (05%) with severe joint and muscle pain. There were also (16%) patients reported the sore throat and (05%) with back pain (Figure 2).

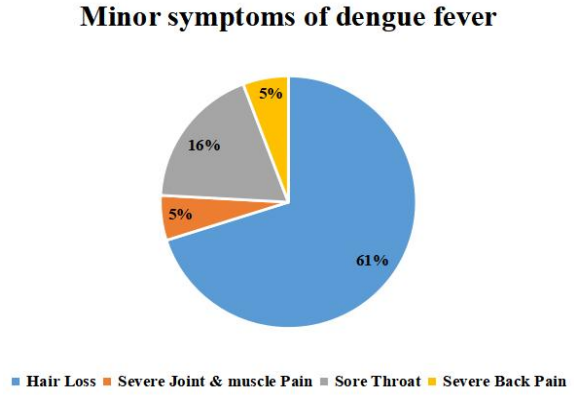

Figure 1: Dengue fever symptoms in patients of district swat.

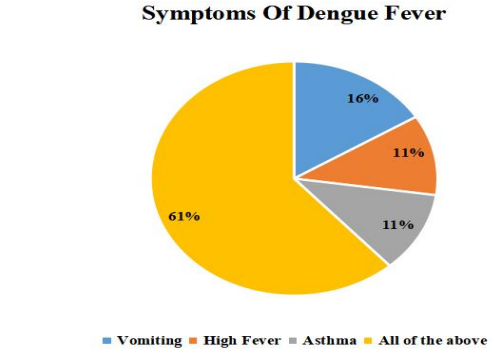

Figure 2: Minor symptoms of dengue fever in patients.

In the next question on nurse's regarding breeding sites for Aedes mosquito specifically in the hospitals. Figure 1.3 showed that the breeding sides in the hospital was (33%) with clean and stagnant water, (44%) with dirty water, (16%) described the running stream.

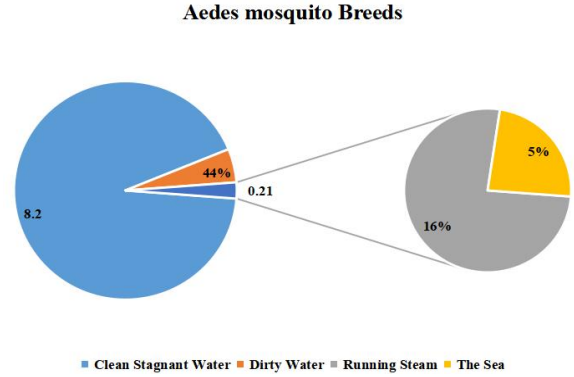

Figure 3: Aedes mosquito breeds in the hospital.

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Further questions regarding the knowledge asked from respondents how much time is required to complete the mosquito lifecycle or incubation period of dengue fever in patients. Figure 1.4 depicts that the incubation period of dengue fever in patients was (33%) 5-10 days, 22% with 3-8 days and 3-14 days (Figure 4).

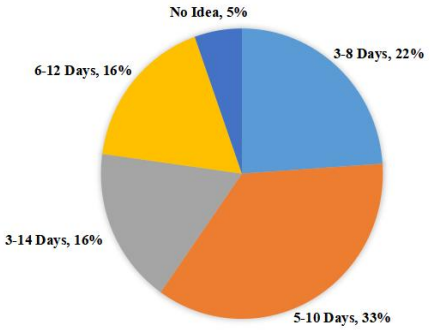

Figure 4: The incubation period of dengue fever in patients of STH Swat.

All of nurses had enough information about the overall transmission risk of dengue viruses among the nurses in the hospital. Nurses had sufficient knowledge about dengue virus and fever which means that hospitals must focus on their area for the safety of nurses and other staff by implementing the guidelines for the protection from exposure to the virus. The data showed that the dengue fever transmitted to nurses in the hospital with 83% and 16% participants answer that dengue is not transmitted to others. Regarding fatalities of dengue fever in different hospitals of Swat is on the satisfactory level and the overall respondent knowledge score is 88% while still need improvement for proper implementation for the control of lethalness of dengue, 1.6 11% say that dengue is not life threatening. The data also identified that; presence of the Aedes mosquito is the cause of dengue fever spread as reported by 92% of nurses. Aedes mosquito spread the viruses which cause dengue fever with 92% in hospital. 82% participants claimed that dengue virus is not going to spread through body touch and 17% claimed that dengue fever is transmitted by body touch. The data shows that 90% participants answer that currently is no vaccine for dengue fever and 10% are claimed that vaccine is available of dengue (Table 3).

Dengue fever is transmitted 62% by mosquito bites, 26% with person to person and 11% through fecal oral route (Figure 5). Preventive measures to reduce risk of dengue fever 50% all of the above and 21% were protective clothing use mosquito and 12% of use mosquito repellent 16% reduce mosquito habitat (Figure 6). Dengue fever is fatal and mosquito presence and identification is difficult Figure 1.12 shows that causative agent for dengue fever is Aedes mosquito (55%). Although the presence of Aedes mosquito in Swat region is less due to low temperature but patient from the neighboring cities like Shangla and Dir play role in the transmission of the virus (Figure 7).

Table 3: Knowledge of transmission, fatality, and treatment regarding the dengue fever

Question	Percentage	
	Yes	No
Dengue fever transmitted from one person to another	83.5	16.5
Dengue fever is life threatening disease	88.5	11.5
Aedes mosquito transmitt viruses which cause dengue fever	92	8
Dengue fever is spread by body touch in patients	82.5	17.5
Vaccine for dengue fever in the Saidu teaching hospital Swat	90	10

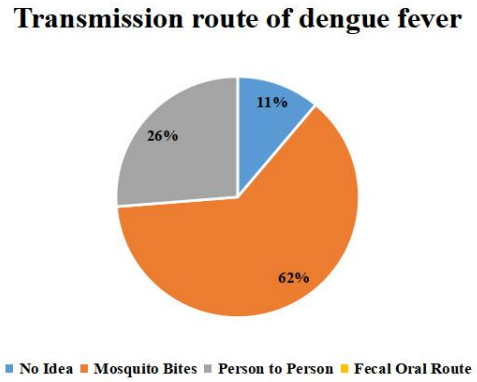

Figure 5: Route of transmission for dengue fever in patients.

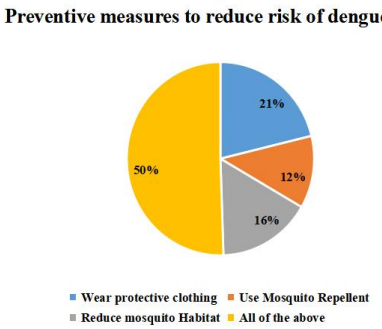

Figure 6: Preventive measure to risk of dengue fever in Saidu teaching hospital Swat.

The knowledge that Aedes usually active to bite is 60% as 7pm-9pm and some people reported that has 18% 6am-8am only and 14% 6am-10am and 6% selected the option I don't know (Figure 8). In this section, we asked questions regarding the practice for the protection of dengue fever. First question to take step to prevent dengue fever transmission. Data figure 1.14 depict of the following data collected from community in taking steps to prevent dengue fever transmission is 83% as cover tightly all water containers and 6% of store the water in fridge and 5% hand washing and 4% use loosely cloths (Figure 9).

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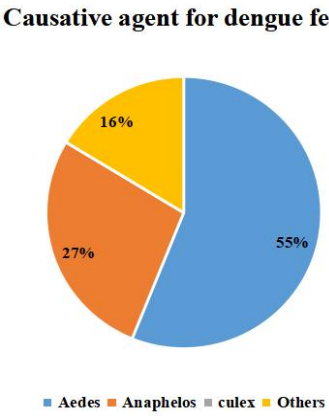

Figure 7: Causative agent of dengue fever in patients of STH Swat.

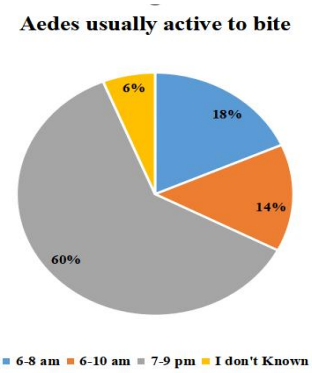

Figure 8: Aedes mosquitoes active to bite the people of district Swat.

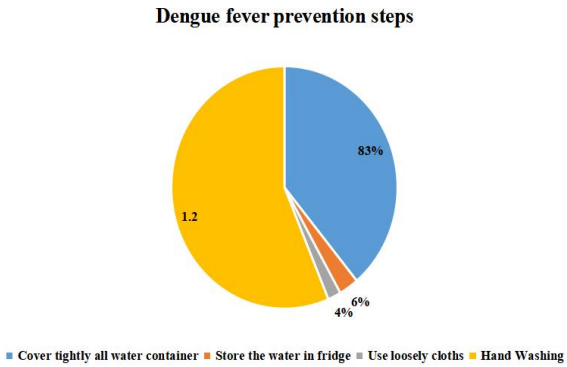

Figure 9: Steps to prevent dengue fever transmission in the hospital.

The treatment of dengue fever during outbreak71% seeked immediate medical attention/ treatment and 23% of people reported they use medication as prescribed after seeing the doctor and 5% others (Figure 10). Aedes mosquito breed insides the house is 44% in the open water tank and 25% in the flower pot trays and 22% in the tray under the fridge and 18% in the water container (Figure 11).

DISCUSSION

This study looked into the various hospitals in Swat Mingora city's knowledge and procedures regarding the dengue virus. In this study, we spoke about the survey results of hospital staff nurses' awareness of dengue disease. The knowledge and practices around dengue disease are discussed, along with the correlations between knowledge and practice for dengue virus control. According to our research, most participants had a basic understanding of DF, thought the condition was severe, and engaged in some form of treatment seeking and prevention. On the other hand, there hasn't been much information or experience with methods for getting rid of mosquitoes and their larvae in residential areas.

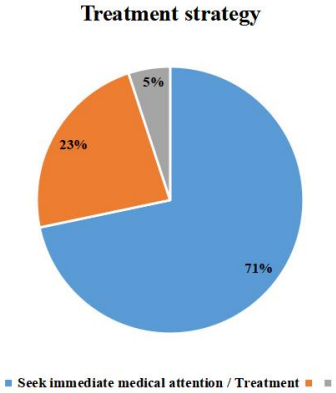

Figure 10: Treatment of dengue fever during outbreak.

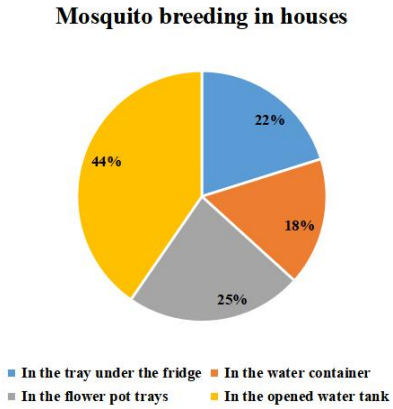

Figure 11: Aedes mosquito breed insides the house.

Lastly main area identification for mosquito breeding site question was asked from respondent with percentage of aedes mosquito breed outsides the house 51% (Figure 12).

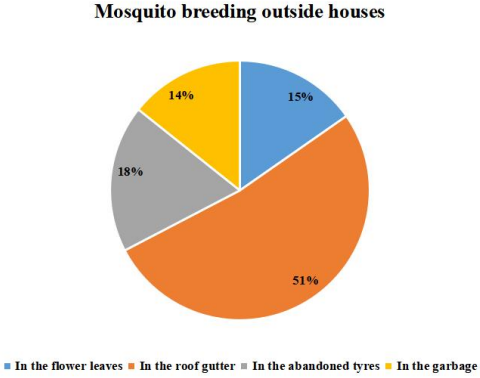

Figure 12: Aedes mosquito breed outsides the house.

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Although there isn't a specific medication that can treat a dengue infection, your body will usually be able to fight off the virus three to four days after the rash appears.[23] Although there aren't any specific antiviral injections or tablets that will eradicate the dengue virus, a patient with dengue fever may still be saved with intensive care. Researchers are working to create a tetravalent vaccination that is effective against all five Dengue serotypes while also being less costly and safer.[24] There are now five different types of vaccines being developed: subunit, chimeric live attenuated, inactivated, and nucleic acid-based vaccines. It takes several doses of these vaccinations to produce immunity. These findings were also included in the article that described how the dengue fever outbreak spreads fatally to humans, along with other published articles.[25]

It appears that the general public is aware of DF because most participants correctly recognized the primary early symptoms of DF (fever lasting longer than two days and headache/joint problems) as well as the illness's origin. This outcome is greater than that of earlier studies carried out in the Thanh Tri District of Hanoi in the communes of Tan Trieu and Dai Ang in 2016.[26]

Most of the participants in this research had heard about DF before. Similar to our study, 90% of respondents in another survey conducted in an urban resettlement region of south Delhi were reported to be aware of dengue.[27] In a Brazilian survey, 78% of participants were aware about dengue. Repetitive exposure to widely disseminated health education messages via mass media, such as newspapers and television, may account for the observed increased awareness.[28] Fewer research participants were aware of the signs of dengue fever, particularly the rash and bleeding that are unique to the condition, which were only cited by 2% and 11% of participants, respectively.[29] Most research participants were aware that DF can result in skin rashes, joint and muscle pain, fever, headaches, and discomfort behind the eyes. These findings are consistent with a study carried out in Nepal, which also found that knowledge levels were lower in highland areas.[5] In this current study, almost 75% of participants agreed that symptoms such as bleeding from the nose, bloody stools, vomiting blood, and stomach pain were indicative of severe DF. Living in an area where the disease is more prevalent increases one's awareness of its warning signs and symptoms.[7]

Most of the participants in this research were aware of and used DF practices. Regarded as the most severe disease among Pakistan's KPK Swat people. A certain amount of treatment and prevention, as well as knowledge about people's attitudes toward getting rid of mosquito larvae in living areas and their behaviors, might be helpful. Higher levels of education and awareness on dengue disease positively link with behaviors. According to the bulk of replies in the survey and the previously gathered data on dengue fever from Pakistani urban areas, 73.3% of respondents knew what dengue fever was, and 26.7% did not.[30]

CONCLUSION

Most of the participants are aware of what dengue fever is. Nonetheless, the people are well-versed in the prevention and spread of dengue disease. The participants were well aware of the danger of dengue fever as well as its main symptoms. Few people were misinformed about biting times and vector identification, and the majority took a proactive stance and actively used preventative measures. Based on this study, a few recommendations are made to enhance awareness and practice about dengue fever and its prevention. Providing appropriate information about the nature of the disease will prove advantageous. Make use of doors and windows. Patch any gaps in the screens to keep mosquitoes out.When air conditioning is available, use it. If you are sleeping outside if there are no suitable air-conditioned or screened-in rooms, cover yourself with a mosquito net. Every week, you should empty and clean, flip over, cover, or discard anything that collects water, such tires, buckets, planters, toys, pools, birdbaths, flowerpots, or garbage cans. Inspect your home from the inside out. It is near bodies of water that mosquitoes lay their eggs. Use mosquito coils, sprays, and repellent.

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Table 2: Descriptive characteristics and the answer provided by the participants

Questions	Numbers	Percentages
Q1: What are the symptoms of dengue fever?		
A. Vomiting	15	16%
B. High fever	10	11%
C. Asthma	10	11%
D. All of the above	55	61%
Q2: Minor symptoms of dengue fever?		
A. Hair drops	55	61%
B. Muscle and severe joint pain	05	05%
C. Sore throat	15	16%
D. Severe backpain	05	05%
E. No idea	10	11%
Q3: Where mosquitos (Aedes) breed?		
A. Clean, stagnant water	30	33%
B. Dirty water	40	44%
C. Running stream	15	16%
D. The sea	05	05%
Q4: Incubation period of dengue fever infection is?		
A. 3-8 days	20	22%
B. 5-10 days	30	33%
C. 3-14 days	20	22%
D. 6-12 days	05	05%
E. No idea		
Q5: Dengue fever transmitted from one to another person?		
A. Yes	75	83%
B. No	15	16%
Q6: Dengue is fatal?		
A. Yes	80	88%
B. No	10	11%
Q7: The viruses that cause dengue fever may be spread by the Aedes mosquito, right?		
A. Yes	83	92%
B. No	07	07%
Q8: Will you acquire the sickness right away if you were bitten by an Aedes mosquito?	26	28%
A. Yes	64	71%
B. No		
Q9: Is it possible for dengue to spread by hand or body contact?		
A. Yes	16	17%
B. No	74	82%
Q10: There is currently no vaccine for dengue fever?		
A. Yes	81	90%
B. No	09	10%
Q11: Transmission route for dengue fever is through?		
A. Person to person	24	26%
B. Mosquito bites	56	62%
C. Fecal-oral route	00	00%
D. No idea	10	11%

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Q12: What can be done to reduce the risk of contracting dengue fever?		
A. Wear protective clothing	19	21%
B. Use mosquito repellent	11	12%
C. Reduce mosquito habitat	15	16%
D. All of the above	45	50%
Q13: How dengue fever is transmitted to a person?		
A. Mosquito bites	54	60%
B. Blood transmission	26	28%
C. Air borne	00	00%
D. Don't know	10	11%
Q14: What is the type of mosquito that carries dengue fever?		
A. Aedes	50	55%
B. Anopheles	25	27%
C. Culex	00	00%
D. Others	15	16%
Q15: When are Aedes usually active to bite?		
A. 6-8am only	17	18%
B. 6-10am	13	14%
C. 7-9pm	54	60%
D. I don't know	06	06%
Q16: What steps do you take to prevent dengue fever transmission during the outbreak?	75	83%
A. Cover tightly all water containers	06	06%
B. Store the water in fridge	04	04%
C. Use loosely cloths	05	05%
D. Hand washing		
Q17: What you have to do to participate in the chemical and biological preventative exercises?		
A. Permit the examination of mosquito larvae both within and outside the dwelling	48	53%
B. Permit the health authorities to use insecticides in areas that might be used for breeding?	22	24%
C. Permit the health authorities to fog the exterior and interior of the house.	12	13%
When fogging, keep the home windows open.	08	08%
Q18: During dengue epidemics, what is your course of action if you become feverish?	64	71%
A. Seek prompt medical attention or therapy	21	23%
B. Take prescription drugs as directed by your doctor after seeing another		
C. Others	05	05%
Q19: Where do you believe Aedes mosquitoes typically breed within homes?	20	22%
A. In the refrigerator's tray	17	18%
B. In the water container	23	25%
C. In the trays for the flower pots within the ajar water reservoir	40	44%
Q20: Where you think Aedes mosquito usually breed outsides the house?	14	15%
D. In the flower leaves	46	51%
E. In the roof gutter	17	18%
F. In the abandoned tires	13	14%
G. In the garbage		