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Original Article

Awareness Regarding Dengue Prevention and Control in Periurban Union Councils of Tehsil Rawalpindi

Naveed Akhtar[1*], Ayesha Babar Kawish[2], Qandeel Tahir[2], Asif Maqsood Butt[3] and Sajid Hameed[4]

[1]District Health Office, Lahore, Pakistan
[2]Al-Shifa School of Public Health, Pakistan Institute of Ophthalmology. Al-Shifa Trust Eye Hospital Rawalpindi, Pakistan
[3]District Health Authority, Rawalpindi, Pakistan
[4]University Institute of Public Health, The University of Lahore, Lahore, Pakistan

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Corresponding Author:
Naveed Akhtar,
District Health Office, Lahore, Pakistan
malikbrothers15@yahoo.com

ABSTRACT

Dengue infection is a challenging disease to treat, because of its multisystemic, varied, unique, and even life-threatening symptoms. Knowledge of these atypical manifestations aids in early discovery, right diagnosis, prompt intervention, and appropriate treatment. **Objectives:** To assess the awareness of dengue prevention and control in Periurban union councils of Tehsil Rawalpindi and to find out the association between awareness regarding dengue prevention and socio-demographic variables through a detailed questionnaire. **Methods:** A cross-sectional study was designed to assess the awareness levels of 413 respondents and association between dengue prevention and socio-demographic variables for six months duration by applying chi-square. **Results:** The results showed that the general public had an adequate level of Dengue control knowledge 250 (60.5%), attitudes 261 (63.2%), and practices 138 (66.6%) as well as a willingness to support dengue control efforts. The knowledge of dengue prevention 250 (60.5%) have adequate and 163 (39.5%) respondents have inadequate knowledge. The attitude toward dengue respondents positive are 261 (63.2%) and the attitude toward dengue respondents negative are 152 (36.8%). The practices toward dengue respondents are good are 66.6% and the practices toward dengue respondents poor are 33.4%. The chi-square test shows a significant relationship between awareness and age, occupation. On the other hand, the relationship between awareness and gender, race, material status, qualification, income, and family are non-significant. **Conclusions:** It is concluded that the respondents had a good understanding of Dengue prevention, behaviors, and knowledge. With further campaigns, the general public's technical understanding might develop even more.

INTRODUCTION

Dengue fever has become much more prevalent in recent decades all across the world. Currently, around half of the world's population is in jeopardy. Dengue fever affects between 100 and 400 million people each year. Dengue fever has spread, particularly in metropolitan and peri-urban regions like Rawalpindi. Dengue fever is the world's fastest-spreading mosquito-borne viral illness. Dengue endemic nations are home to around 2.5 billion people. Dengue fever is a difficult disease to treat because of its multisystem, variable, unusual, and occasionally life-threatening symptoms. Early detection, proper diagnosis, rapid intervention, and appropriate treatment are all aided by knowledge of these uncommon presentations. Dengue virus infection remains a clinical challenge in every way. To identify patients and prevent outbreaks, complications, and death, ongoing sero-epidemiological surveillance, prompt interventions, vaccine development, and vector control measures are required [1]. Dengue outbreaks are caused by a variety of variables including public ignorance, climate change, insufficient financing, and poor surveillance. As a result, scientific research in the Punjab, Sindh interior, and Khyber Pakhtunkhwa provinces of Pakistan, where dengue outbreaks have occurred over the past decade and dengue is also a real risk of non-

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epidemiology, should be increased [2]. Appropriate dengue preventive actions are significantly influenced by knowledge, danger perception, and self-efficacy. Through television, prevention and control initiatives should focus on raising knowledge about the danger and severity of dengue infection. Individual self-efficacy should be emphasized in health communications [3]. Dengue fever is a severe flu-like illness that can afflict babies, toddlers, and adults, although it is seldom fatal. Symptoms usually persist 2–7 days after an incubation period of 4–10 days following a bite from an infected mosquito [4,5]. By taking preventative actions to alleviate hospital overcrowding. This study is significant in terms of determining the influence of dengue activities on dengue prevention. Dengue prevention and control are dependent on successful vector control methods, and continuous community engagement can help to enhance vector control efforts. As a result, this research is critical, as dengue activities can play a critical role in this, and the issue is emphasized. A cross-sectional survey-based study was designed to assess the awareness/attitude, prevention (KAP), and control in Periurban union councils of Tehsil Rawalpindi for six months. The study was aimed to find out the association between awareness regarding dengue prevention and control and socio-demographic variables through a detailed questionnaire. The goal of a survey by Koonisetty et al. (2021) was to find out about physicians' knowledge, attitudes, and practices (KAP) when it comes to diagnosing and treating dengue fever. Physicians from Turkey, a nonendemic nation, Bangladesh, India, and Malaysia, three dengue-endemic countries, participated in this study. This study aided in the development of a guideline for clinicians to follow to achieve good treatment results and lower dengue mortality [6]. Itrat et al. (2008) determined the degree of dengue fever knowledge, attitudes, and practices among persons who visited tertiary care facilities in Pakistan. The overall prevalence of sufficient knowledge' based on their criteria was found low [7]. We found that there was a sufficient prevalence of illness prevention behaviors. Further research into the relationship between knowledge and its efficiency in combating dengue fever will be useful in establishing the impact of public awareness efforts. A cross-sectional study was undertaken in selected rural areas in the Kuala Kangsar district to examine the degree of knowledge, attitude, and behaviors about dengue and its vector, the Aedes mosquito. The community's knowledge was determined to be adequate. 82.0 percent of the 200 respondents said that television/radio was their primary source of dengue information. The attitude of the responders was positive, and the majority of them were in favor of Aedes control efforts. There is a strong link between awareness of dengue fever and attitudes toward Aedes management. It was also discovered that having strong knowledge does not always imply having good practice [8]. Syed et al. (2010) sorted data from 400 respondents. About 35% of the people in the survey knew enough about dengue illness and its vector [9]. Education and socioeconomic position exhibited significant relationships with knowledge. The group with a higher socioeconomic status had stronger preventative measures. Future health programs should have a stronger emphasis on poor socioeconomic areas. Gul et al. (2014) gathered data from 154 existing Union Councils in Lahore, with a sample size of 800 households [10]. Dengue fever knowledge, attitudes, and behaviors were among the data collected. Dengue fever was known in 98 percent of the individuals. Even though 67 percent of respondents knew enough about dengue, just 3.7 percent were using it. The majority of mosquito bite prevention strategies (70.4 percent) were focused on mosquito coil use rather than the elimination of mosquito breeding areas. The most common source of knowledge regarding dengue fever was television (91 percent). There was a significant gap between receiving knowledge and putting it to use, which must be bridged as soon as possible to prevent future illness outbreaks. Qureshi et al. (2014) performed a cross-sectional study in Samanabad Town, Lahore, to examine people's knowledge, attitudes, and practices surrounding dengue illness. Data was collected from 560 respondents using purposeful random sampling. The majority of the responders (90.5%) had a basic understanding of the vector. High-grade fever was the most common and visible symptom, according to 41.4 percent, 97.1 percent recognized the fever was spread by mosquitoes from one person to another, and 72.5 percent thought pots and containers filled with water were the main breeding grounds for the dengue mosquito. Only 34.5 percent thought the Aedes mosquito bites usually in the evening, and 47.5 percent thought the fever isn't communicable [11].

METHODS

A cross-sectional study was conducted for 6 months. The study was conducted in households of peri-urban union councils of Rawalpindi, Pakistan. All the participants residing in peri-urban areas of Rawalpindi were included with informed consent. The data were collected with the following mandatory requirements: A permission letter from Al-Shifa School of Public Health's review board /committee, and a permission letter from district health authority Rawalpindi. Data on the sociodemographic characteristics and KAPs of the participating household heads were collected using a pre-designed structured questionnaire (via. Google form). Following sources were

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used to prepare the questionnaires: Punjab Dengue Prevention & Control Program, (2021), Abdullah et al., (2013), and Selvarajoo et al. (2020) [12,13]. The questionnaire contained two sections: First section A was related to the information collection on sociodemographic variables such as gender, age, race, marital status, educational status, occupation, income, family structure, and socioeconomic status. The second section B was related to the participant's knowledge, attitudes, and practices (KAPs) about dengue prevention and control activities. The questionnaire of sub-section B1 was comprised of knowledge-related information. The questionnaire of sub-section B2 was comprised of attitudes-related information. The questionnaire of sub-section B3 was comprised of practice-related information. All data including qualitative variables, frequencies & percentages, & means, etc. were analyzed using SPSS version 25.

RESULTS

Total of 413 responses were received through Google form. The majority of people (92.7%) fell in the above 50 years age group, 60.7% were males. 89.1% were Punjabi. Some 57.8% were married individuals. Almost half (50.6%) of the study population were graduates and working (86.6%). The majority 79.1% were earning above 10000 rupees per month. The family structure was joint in 55.6% and socioeconomic status was average in 49.8% of the group. Knowledge towards dengue prevention: Most people had heard of Dengue (98.3%) through Radio or television sources (35.3%). Around 98% of people knew that cause of dengue is mosquito bites. They also knew that little water (5 ml) or so is required for the breeding of mosquitoes and that they bite usually in the morning or late evening. 98% knew Full sleeves & light-colored clothes are best to protect against bites of mosquitoes and that the rainy season is the only outbreak of dengue infection. Above 90% of the population knew about the benefits of using repellents and coils and larvae removal for controlling the spread of dengue. 74% knew about chemical fogging to prevent dengue. Around 82% of people knew that eggs of dengue mosquitoes can survive dry conditions for up to 6 months. Table 1 shows the detail of the questions related to knowledge of dengue by the 413 respondents. Attitudes towards Dengue Prevention: The general attitude was good. 89.5% of People wanted to help reduce the number of dengue cases in their area, by checking their hotspots and agreeing to take extra precautions if the cases were to rise in their area. 95% agreed to use full sleeves and light-colored clothes as they prevent mosquito bites. 53.9% of people agreed that it is their responsibility to remove mosquito breeding sites.64% of people reported that they were not infected by dengue. People agreed that dengue outbreaks could be controlled if everyone was committed to removing breeding sites for mosquitoes in their area and continuing this exercise even when there is no dengue outbreak. Table 2 shows the detail of the questions related to attitudes on dengue prevention by the 413 respondents. Practices towards dengue prevention: Nearly all (99%) people agreed to safe water usage practices like closing the water container after use, changing water plant/ flower containers in the house weekly and checking for blocked water flow due to garbage/waste, and checking for the cleanliness of drains and gutters on the roofs (94.1%). People used mosquito repellents. The majority (88%) were also part of the dengue prevention campaigns in their area. Table 3 shows the detail of the questions related to the consistency of practice by the 413 respondents. Statistical Analysis: All the bi-responses from the performa were calculated through chi-square to find out the significance or insignificance between the responses of the respondents (n=413). The p-value indicated that there existed a significant difference between Yes/No replies of the respondents of the sections of the questionnaire. B1: Knowledge towards dengue prevention. B2: Attitudes towards dengue prevention and B3: Practices towards dengue prevention.

Questions	Categories	Percentage n(%)
Ever heard about dengue?	Yes	406 (98.3%)
	No	7 (1.69%)
If yes, what was the source of information?	Newspaper	103 (24.9%)
	Radio/TV	146 (35.3%)
	Friends	92 (22.2%)
	Doctors	72 (17.4%)
Dengue is caused by the bite of a mosquito	Yes	407 (98.5%)
	No	6 (1.4%)
A mosquito may grow in as little as 5-ml of clean water.	Yes	398 (96.3%)
	No	15 (3.6%)
Mosquitos like to bite in the morning and late evening	Yes	405 (98%)
	No	8 (1.9%)
Dengue fever only occurs during the rainy season.	Yes	266 (64.4%)
	No	147 (35.5%)
Full sleeves & light-colored clothes are best to protect	Yes	407 (98.5%)
	No	6 (46.1%)
Dengue mosquito feed on dumpy & waste sites	Yes	331 (80.1%)
	No	82 (19.8%)
Mosquito repellent & coils are used to protect from dengue	Yes	394 (95.3%)
	No	19 (4.6%)
Dengue mosquito breed in stagnant clear water from old tyres & flower pots	Yes	406 (98.3%)
	No	7 (1.69%)
Larvae removal can be beneficial in dengue control	Yes	405 (96.8%)
	No	8 (1.93%)
Container or tank without a lid should be cover	Yes	391 (94.6%)
	No	22 (5.3%)
Chemical fogging is good enough to prevent dengue	Yes	306 (74%)
	No	107 (25.9%)
Dengue mosquito can breed both indoors and outdoors	Yes	399 (96.6%)
	no	14 (3.3%)
Eggs can survive in dry conditions for up to six months	Yes	340 (82.3%)
	No	73 (17.6%)

Table 1: Section B1: Knowledge towards dengue prevention (n= 413)

Questions	Categories	Percentage n(%)
I'd want to contribute to lowering the number of dengue cases in my community.	Yes	370 (89.5%)
	No	18 (4.3%)
	Not sure	25 (6%)
I keep an eye on dengue outbreaks or hotspots in my neighborhood on a daily basis	Yes	366 (88.6%)
	No	31 (7.5%)
	Not sure	16 (3.8%)
If I'm aware that the chance of contracting dengue fever is rising in my location, I'll take extra precautions to avoid infection	Yes	369 (89.3%)
	No	8 (1.9%)
	Not sure	36 (8.7%)

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I will wear full sleeves and light -colored clothes as they are best to protect from dengue fever	Yes	396 (95.8%)
	No	17 (4.1%)
I will light a small light to lit rooms as dengue mosquito like dark places	Yes	378 (91.5%)
	No	35 (8.4%)
I will clean my home and keep my street clean as dengue mosquitoes feed on dump & waste sites	Yes	373 (90.3%)
	No	40 (9.6%)
Are you recently infected with dengue?	Yes	148 (35.8%)
	No	265 (64.16%)
I will use mosquito repellent and coil to protect from dengue	Yes	368 (89.1%)
	No	45 (10.8%)
The removal of mosquito breeding areas on my property will minimise my family's risk of contracting dengue fever	Yes	356 (86.1%)
	No	5 (1.2%)
	Not sure	52 (12.5%)
The use of chemical fogging by health officials is effective in preventing dengue illness.	Yes	271 (65.6%)
	No	105 (25.4%)
	Not sure	37 (8.9%)
is not my obligation to get rid of mosquito breeding grounds in my home.	Yes	175 (42.3%)
	No	223 (53.9%)
	Not sure	15 (3.6%)
Is it vital to continue removing mosquito breeding areas from your house even if there isn't an outbreak?	Yes	358 (86.6%)
	No	55 (13.3%)
My community's dengue outbreak can be contained if every home commits to eliminating mosquito breeding areas.	Yes	374 (90.5%)
	No	39 (9.4%)
I'll participate in a public activity aimed at preventing dengue fever or eliminating mosquito breeding grounds.	Yes	353 (85.4%)
	No	9 (2.1%)
	Not sure	51 (12.3%)

Table 2: Section B2: Attitudes Towards Dengue Prevention (n= 413)

Questions	Categories	Percentage n(%)
Do you always close the water bottle after you've used it?	Yes	409 (99%)
	No	4 (0.9%)
Have you done anything to get rid of the Aedes mosquito larvae in the water tank?	Yes	393 (9.4%)
	No	20 (153%)
Do you replace the water plant pots in your home on a weekly basis?	Yes	385 (93.2%)
	No	28 (6.7%)
Do you regularly replace the water in the flower pot?	Yes	400 (96.8%)
	No	13 (3.1%)
Do you ever look in a flower pot for mosquito larvae?	Yes	386 (93.4%)
	No	27 (6.5%)
Have you checked for rubbish or garbage that is obstructing the flow of water around your house?	Yes	391 (94.6%)
	No	22 (5.3%)
If so, did you throw it away or dispose of it?	Yes	386 (93.4%)
	No	27 (6.5%)
To avoid dengue fever, I use insect repellent and a coil.	Yes	394 (95.3%)
	No	19 (4.6%)
Do you take part in any of your community's dengue - infection campaigns?	Yes	367 (88.8%)
	No	46 (11.1%)
Have you checked the toilet tank for Aedes mosquito larvae?	Yes	343 (83%)
	No	70 (16.9%)
During the wet season, did you examine and clean the drains/gutter roofs?	Yes	389 (94.1%)
	No	24 (5.8%)

Table 3: Section B3: Practices towards dengue prevention (n= 413)

DISCUSSION

Dengue fever has become a worrisome public health hazard in many parts of the tropics due to rising epidemic activity and challenges in managing the insect vector. The current study was aimed at viewing the level of public awareness about Dengue disease in Rawalpindi. It also gave us an idea about the will and practices of the responders in preventing the spread of Dengue. The majority of people (98.3%) had heard of Dengue through radio or television (35.3 percent). Around 98 percent of respondents were aware that mosquito bites are the cause of dengue fever. They also knew that mosquitoes require only a small amount of water (5 mL) to grow and that they bite most often in the morning or late evening. 98 percent were aware that full sleeves and light-colored clothing are the best ways to avoid mosquito bites and that the rainy season is the only time when dengue fever occurs. More than 90% of the public was aware of the benefits of utilizing repellents, coils, and larval removal to prevent the spread of dengue fever. Seventy-four percent were aware of the use of chemical fogging to prevent dengue fever. Dengue mosquito eggs may survive dry circumstances for up to 6 months, according to 82 percent of individuals. The prevailing mood was positive. 89.5 percent of respondents intended to assist reduce the number of dengue cases in their region by examining hotspots and agreeing to take extra measures if the number of cases in their area increased. Mosquito bites are prevented by wearing long sleeves and light-colored clothing, according to 95% of respondents. 53.9 percent of respondents believed that removing mosquito breeding locations is their duty. Sixty-four percent of those surveyed said they had not been afflicted with dengue fever. People agreed that a dengue outbreak could be contained if everyone committed to eliminating mosquito breeding areas in their region, and to continue doing so even if there was no dengue outbreak. Almost everyone (99%) agreed that safe water consumption habits include sealing the water container after use, replacing water plant/flower containers in the house weekly, checking for obstructed water flow due to garbage/waste, and inspecting drains and gutters on the roofs for cleanliness (94.1 percent). Mosquito repellents were employed. The vast majority (88 percent) were also involved in local dengue prevention programs. The general public had a good amount of knowledge, attitude, and practices (KAP) and the will to support Dengue control campaigns. They were inclined to abide by healthy and safe practices as advised by authorities against Dengue. Our KAP survey analysis indicated that the majority of responders have correctly answered the questionnaires. There were very few areas where the public lacked information, for example, that the rainy season accounts for the most spread of the dengue disease where only 64% of responders knew it. Moreover, chemical fogging was not known to approximately 35 % of responders. Such technical information could be delivered to the general public with further campaigns. Nearly half of the responders shared that they did not feel the responsibility of removing the breeding sites in the area which was not very overwhelming. There existed a significant difference between the replies of the respondents to the KAP questionnaires. This indicates that the responders were clear about Dengue prevention, practices, and knowledge. Two studies acknowledged the relevance of water container productivity as a metric of vector density; nevertheless, no cluster randomization was attempted, and costs and sustainability were not addressed in any of the investigations. There is no proof that community-based dengue control programs, alone or in conjunction with other control efforts, can improve dengue control efficacy [14]. There is a strong link between awareness of dengue fever and attitudes toward Aedes management. It was also discovered that having strong knowledge does not always imply having good practice.

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This is most likely owing to firmly rooted behaviors in the community, such as water storage for home consumption [8]. Several researchers have investigated and reported population knowledge, attitudes, and behaviors (KAP) surrounding dengue throughout the previous few decades. The highest scores on the measure indicated a greater level of knowledge and expertise. Because the attitudes measure did not show the same connection, it was excluded from the research. In the quantile regression, age, years of schooling, and a family history of dengue fever were all positively related to lower levels of awareness about the disease. The influence of such factors gradually waned or eliminated as knowledge grew. Furthermore, the size of the influence of socioeconomic variables on knowledge scores changes with knowledge level, indicating that additional factors may be influencing higher levels of knowledge [15]. 521 families in two villages in Yogyakarta, Indonesia, participated in a cross-sectional study. The population's knowledge, attitudes, and practice scores were summed by sex, age, occupation, and education. The average knowledge score was 3.7 out of 8, but both the attitude and practice ratings were excellent. There were numerous notable gaps in understanding of fundamental dengue symptoms, preventative techniques, and the Aedes mosquito's biting and breeding activities. As a result, they developed a vector control card to aid people in their container cleaning approaches. In 2015, the card was tested for eight weeks, using pre-post larvae positive residences and containers as the main result indicators. To raise motivation levels, bottom-up solutions engaging all community members in dengue management, not just those who already follow best practices, are required [16]. In 2001, there was a large dengue epidemic in Chennai, with 737 cases (90 percent) out of a total of 861 cases reported in Tamil Nadu. Only 34.5 percent of the total homes polled recognized what dengue was, and only 3.3 percent knew that the virus is the cause of dengue fever. Water storage was done by the majority of the Households (86.5%), however, just 3% of them kept water for more than 5 days. The majority of Households did not take any precautions to prevent mosquito breeding in their water-holding containers (65 percent). Sixty percent of Households were uninformed of the biting behavior of the dengue vector mosquito. The study's findings reveal that community knowledge of dengue fever, its transmission, vector breeding places, biting behavior, and preventative techniques is severely lacking. To combat the dengue problem, health education programs regarding the sickness must be developed to improve community awareness and sensitize the people to participate in an integrated vector control effort [17]. A Knowledge, Attitudes, and Practices survey was distributed to 600 randomly selected families in 30 villages in Kampong Cham, one of Cambodia's most populated districts. The majority of participants thought they were in danger and that dengue transmission is avoidable, and they had a high degree of knowledge on dengue transmission, Aedes breeding, and biting prevention strategies. Self-reported vector control behaviors, on the other hand, did not match those found in the surveys [18].

CONCLUSION

It is concluded that the general population possessed a high level of knowledge, attitudes, and practices as well as a willingness to support Dengue control efforts. They were more likely to follow the authorities' recommendations for healthy and safe Dengue habits. There were just a few areas where the public lacked knowledge. With more dengue control programs and associated campaigns, such technical knowledge could be further improved among the general public.

REFERENCES

[1] Ashok KV, Rajendran R, Manavalan R, Tewari SC, Arunachalam N and Ayanar K et al., Studies on community knowledge and behavior following a dengue epidemic in Chennai city, Tamil Nadu, India. Trop Biomed. 2010,27(2):330-6.

[2] Abdullah M, Azib WN, Harun M and Burhanuddin M. Reliability and construct validity of knowledge, attitude and practice on dengue fever prevention questionnaire. Am Int J Contemp Res. 2013,3:69-75.

[3] Ahmad S, Aziz MA, Aftab A, Ullah Z, Ahmad MI and Mustan A. Epidemiology of dengue in Pakistan, present prevalence and guidelines for future control. Int J Mosq Res. 2017,4(6):25-32.

[4] Gul SN, Ghafoor F and Jajja MA. Knowledge, Attitude and Practices Regarding Dengue Fever in Lahore, Pakistan. Pakistan Journal of Medical Research. 2014;53(2):34.

[5] Hairi F, Ong CH, Suhaimi A, Tsung TW, bin Anis Ahmad MA and Sundaraj C et al., A knowledge, attitude and practices (KAP) study on dengue among selected rural communities in the Kuala Kangsar district.2003;3743.doi.org/10.1177/10105395030 1500107

[6] Higuera-Mendieta DR, Cortés-Corrales S, Quintero J and González-Uribe C. KAP surveys and dengue control in Colombia: disentangling the effect of sociodemographic factors using multiple correspondence analysis. PLoS neglected tropical diseases. 2016,10(9):e0005016. doi.org/10.1371/journal.pntd.0005016

[7] Heintze C, Garrido MV and Kroeger A. What do community-based dengue control programmes

DOI:https://doi.org/10.54393/pbmj.v5i1.237

achieve? A systematic review of published evaluations. Transactions of the Royal Society of Tropical Medicine and Hygiene. 2007,101(4):317-25. doi.org/10.1016/j.trstmh.2006.08.007

[8] Itrat A, Khan A, Javaid S, Kamal M, Khan H and Javed S et al., Knowledge, awareness and practices regarding dengue fever among the adult population of dengue hit cosmopolitan. PloS one. 2008,3(7):e2620.doi.org/10.1371/journal.pone.0002620

[9] Kumaran E, Doum D, Keo V, Sokha L, Sam B and Chan V et al., Dengue knowledge, attitudes and practices and their impact on community-based vector control in rural Cambodia. PLoS neglected tropical diseases. 2018,12(2):e0006268.doi.org/10.1371/journal.pntd.0006268

[10] Koonisetty KS, Aghamohammadi N, Urmi T, Yavaşoglu Sİ, Rahman M and Nandy R et al., Assessment of Knowledge, Attitudes, and Practices Regarding Dengue among Physicians: A Web-Based Cross-Sectional Survey. Behavioral Sciences. 2021,11(8):105. doi.org/10.3390/bs11080105

[11] Laul A, Laul P, Merugumala V, Pathak R, Miglani U and Saxena P. Clinical profiles of dengue infection during an outbreak in Northern India. Journal of tropicalmedicine.2016;2016.doi.org/10.1155/2016/5917934

[12] Qureshi EM, Vehra S, Ghafoor GZ, Ali AS and Ahmad F. Community perception regarding dengue epidemic in Lahore, Pakistan. Pakistan Journal of Science. 2014,66(1):7.

[13] Siddiqui TR, Ghazal S, Bibi S, Ahmed W and Sajjad SF. Use of the health belief model for the assessment of public knowledge and household preventive practices in Karachi, Pakistan, a dengue-endemic city. PLoS neglected tropical diseases. 2016,10(11):e0005129.doi.org/10.1371/journal.pntd.0005129

[14] Syed M, Saleem T, Syeda UR, Habib M, Zahid R and Bashir A et al., Knowledge, attitudes and practices regarding dengue fever among adults of high and low socioeconomic groups. Journal of the Pakistan Medical Association. 2010,60(3):243.

[15] Sulistyawati S, Dwi Astuti F, Rahmah Umniyati S, Tunggul Satoto TB, Lazuardi L and Nilsson M et al., Dengue vector control through community empowerment: lessons learned from a community-based study in Yogyakarta, Indonesia. International journal of environmental research and public health. 2019,16(6):1013. doi.org/10.3390/ijerph16061013

[16] Selvarajoo S, Liew JW, Tan W, Lim XY, Refai WF and Zaki RA et al., Knowledge, attitude and practice on dengue prevention and dengue seroprevalence in a dengue hotspot in Malaysia: A cross-sectional study. Scientificreports.2020,10(1):13.doi.org/10.1038/s41598-020-66212-5

[17] World Health Organization, Special Programme for Research, Training in Tropical Diseases, World Health Organization. Department of Control of Neglected Tropical Diseases, World Health Organization. Epidemic, Pandemic Alert. Dengue: guidelines for diagnosis, treatment, prevention and control. World Health Organization; 2009.

[18] World Health Organization. Fact Sheet. Dengue andSevereDengue.2010.Available:https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue