



A CROSS-SECTIONAL STUDY OF DENGUE FEVER KNOWLEDGE, ATTITUDE AND PRACTICES OF THE INHABITANTS IN KHYBER DISTRICT, KHYBER PAKHTUNKHWA, PAKISTAN

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Introduction

Infectious Dengue fever (DF) is systemic febrile, which is flu-like viral disease that is spread due mosquitoes and can affect people of all ages (Thomas et al., 2007), caused by an RNA-virus from the family Flaviviridae, Flavivirus genus (Akram et al., 2015; Heaton & Randall, 2011; Khan et al., 2018; Naeem-Ullah & Akram, 2009). Dengue virus has four distinctive serotypes namely DENV-1, 2, 3 and 4 (Chakravarti et al., 2002; Qureshi et al., 2014) and it is nearly possible for the same person to be infected four times (WHO, 2022). The dengue fever is one of the fastest spreading arboviral disease worldwide (Bhatt et al., 2013a; Garg et al., 2018), with the raising prevalence of 30-folds over the last 50 years (Alexander et al., 2011). Moreover, dengue is the world second most common disease after malaria (Trivedi & Chakravarty, 2022). DF is currently world's one of the leading health concerns. About 390 million dengue virus infections are estimated by a modeling per year (Trivedi & Chakravarty, 2022).

It is believed that infectious Dengue is to expand in Pakistan. First case of Dengue was registered in Hub, a city in Baluchistan in the year 1960, at that time total population of Pakistan was 45.9 million. From 1960-1980, just 12 cases were registered (Chan et al., 1995; Fatima et al., 2012; Rasheed et al., 2013). During the year 2007, 2008, also 2009 an epidemic of Dengue illness reported in Khyber Pakhtunkhwa province of Pakistan. In Landi Kotal, a district located in northern Pakistan near Peshawar KPK, *Ae. aegypti* was reported in the year 1996 (Qutubuddin, 1960).

For effective control of dengue, it is a necessary step to recognize the risk elements for this viral disease (Liu et al., 2019). Some of the risk factors for the current epidemic of dengue disease are socio-economic elements like rapid increase in population of the area, inappropriate urbanization, settlement of the population, and other limitations on preventive measures (Khanani et al., 2011).

Moreover, no study reported in the District Khyber of KPK before this one. All other studies are conducted in the main cities of Pakistan. Thus, this study aimed to assess and compare the KAP among the people residing in different tehsils of District Khyber, Khyber Pakhtunkhwa, Pakistan.

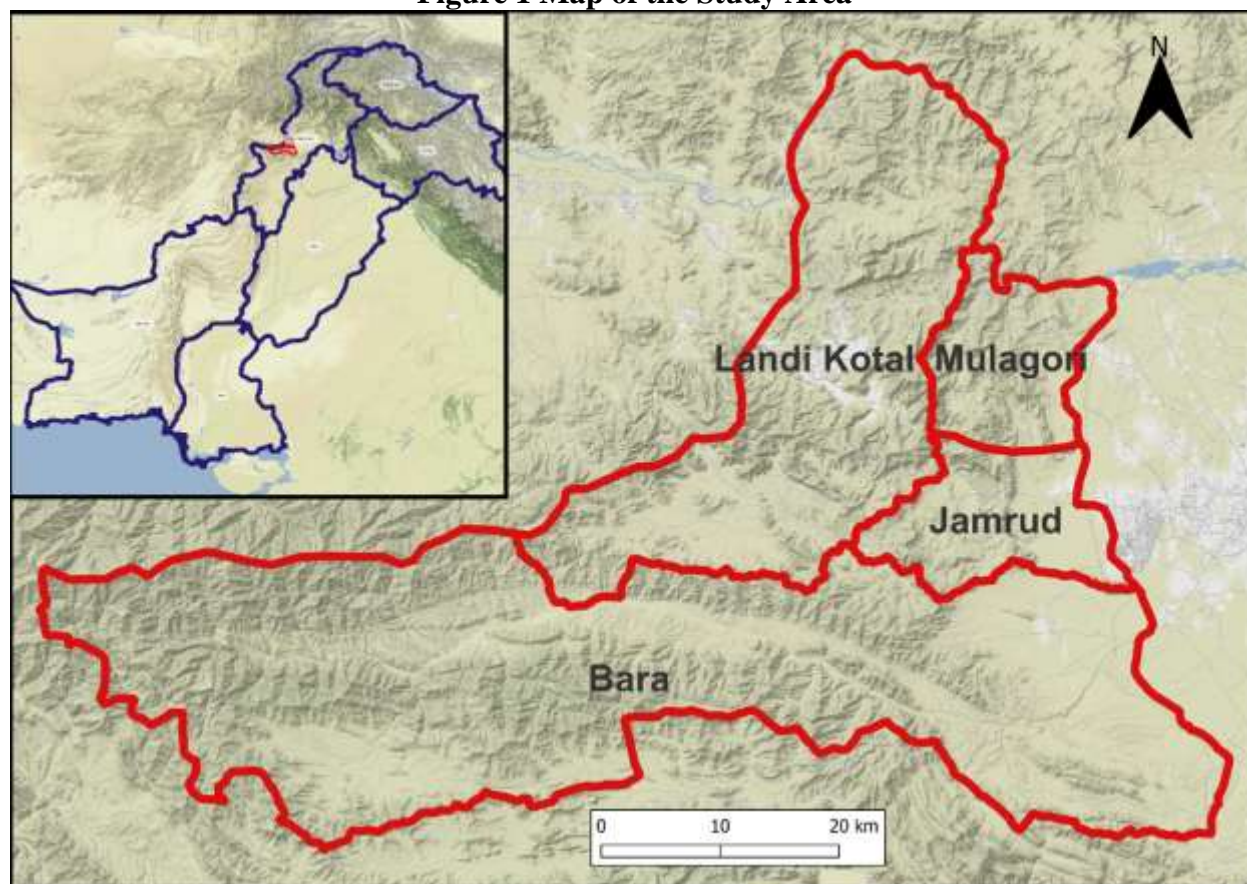
Materials and Methods

Study design and Area description

It is a cross-sectional mixed-method (Qualitative and Quantitative) descriptive analysis study, conducted from August to December 2020 in all the tehsils of District Khyber using household surveys (HHS) and in-depth interviews (IDIs).

District Khyber is located in Peshawar Division in the province Khyber Pakhtunkhwa near the border of Afghanistan in Pakistan. Khyber was an agency of Federally Administered Tribal Areas until 2018, merging FATA with KPK, becoming a province.

Figure 1 Map of the Study Area



Study variables

Participants Selection

Participants after fulfilling eligibility criteria mentioned below were involved in the study.

- (1) Inhabitant of District Khyber for the last 15 years.
- (2) In this study participated voluntarily.
- (3) Above the age of 18.

Questionnaire

In order to fill the pre-coded self-designed questionnaire head-to-head interviews were conducted. All questions of the questionnaire were written in English language and subsequently translated into Pashto (which is local language of the area) and was later again retranslated into English with the certainty that the sense of the asked questions stayed same. In case of facing any difficulty, participants were provided with assistance in completing the questionnaire.

The said questionnaires included 43 items have both type of questions; open-ended and closed-ended questions were tailored to assess the facts, approach and practices of all participants of research about dengue fever. Almost all items of the questionnaire were designed after doing a keen review of the

prior literature. Shortcomings observed during pilot test of the questionnaire were corrected later and the feasibility of the study was tested. The information in the Questionnaire were in form of mcqs and were divided into almost four main parts:

- a) Sociodemographic facts:
- b) information based questions:
- c) approach based questions:
- d) Questions regarding the prevention practices of Dengue.

Information based questions

This part consists of those questions which were related to knowledge assessment of all participants concerning different aspects such as signs and symptoms, disease causing agent, incubation period of the disease, breeding sites for virus, ways of transmission, characteristics and properties of vector and precautionary measures about dengue. This questionnaire has almost 20 questions regarding knowledge. Questions in this part of the questionnaire consist of nearly twenty items with close-ended questions having option of either “YES”, “NO” or “DON’T KNOW (DNN)” Each and every of the correct option was marked as 1-point, 0 coded for option which was wrong whereas DNN option was hinted ‘0’. so, the total range of score was from 0 to 20.

On the other hand, knowledge’s level has been classified into; very low with percentage less than (<60%), low with percentage (60-69), moderate with a percentage of (70-79), high having percentage of (80-89), and last one very high having percentage of (90-100). As a result, knowledge score of percentage $\geq 80\%$ was measured in adequate.

Evaluation of data

For each of the statement in evaluating KAP, all participants were able to choose any one of the responses. A scoring system was used for execution of KAP evaluation. Valid responses were considered correct. 1 was used as a code for correct answer and 0 was used for wrong options. The ‘Do not know (DNN)’ answer of the participants was coded 0. It was found reasonable and justifiable to mark DNN option as a wrong answer. The participants “DNN” response cannot expelled while having a research survey because dropping of such “DNN” responses would reduce the size of study sample, which can cause selection of samples bias, resulting some serious loss of facts and figures (Wang, 1997). The frequency was grouped into two categories after descriptive analysis, for example., adequate vs. inadequate or good vs. poor.

Table 1 Group of variables and theme included in the study

Group of variables	Themes included
Sociodemographic data	Age, gender, occupation, qualification, marital status, area and socioeconomic status
Knowledge	What is dengue, disease spread by mosquitoes, have you been victim of dengue fever, how disease is transmitted, most life-threatening sign of dengue, have you ever heard the name of black mosquito, how it is prevented, what are symptoms, name of the vector, time of biting, in which season the mosquitos are in abundance, in which part of the body mosquito bite, is there any role of plants in mosquito abundance, an dengue transmit from an infected person to normal individual, who are mostly at risk of getting mosquitos bite, and breeding sites, is dengue preventable, is vaccination available for dengue, and level of the danger of the dengue fever.
Attitudes	Seriousness of dengue fever, are you at risk of getting it, can dengue fever be prevented, does dengue fever needs hospitalization, Is the Govt. responsible for controlling the breeding of mosquitos, what is your opinion about last year’s impact, your view about future probability of dengue spread?

Practices	What practices are required to prevent the diseases, do you store water at home, if yes do you frequently change water, are windows and doors of your house properly screened, are mosquito repellants, coils, and sprays easily available in your area, what could be preventive measures against dengue in community, is your area sprayed by Govt. or NGOs, which is most effective measure for control of dengue, and measures to kill larvae.
Sources of Information	What were the sources of information and how often they were used to be informed

Analysis of data

Analysis of collected data was performed with the help of tables, suitable graphs such as pie and bar charts and by frequency and percentages calculation. A survey with study sample of 692 participants was calculated with a percentage of 95% confidence interval, a sample error of five (5%) was recorded, rate of non-response was 15%, and 50% of total assumed Knowledge and Attitude prevalence, using epi toll via link <https://www.openepi.com/SampleSize/SSPropor.html>. The data reliability was checked with the Cronbach's Alpha reliability test which should be equal to or more than 0.7 value. For analyzing data, Pearson's Chi Square test was applied using IBM SPSS version 26. Significance level was considered at p -value <0.05 for each question.

Table 2 Reliability statistics of the study
Reliability Statistics

Cronbach's Alpha	N of Items
0.745	49

Results

Characteristics of the study population in District Khyber

This study provides demographic information on a sample of 696 individuals. It includes information on gender, different age-groups, participants education, individuals' occupation, marital status of population, and socio-economic status. The sample included 510 males (73.70%) and 182 females (26.30%). The age-group distribution of the sample is as follows: 24.42% (169 participants) were in the 18-30 age group, 35.26% (244 participants) were in the 31-40 age group, 16.47% (114 participants) were in the 41-50 age group, 14.74% (102 participants) were in the 51-60 age group, and 9.10% (63 participants) were above 60 years of age. A 20.23% (140 individuals) were illiterate, 29.34% (203 individuals) had completed primary education, 31.21% (216 individuals) had completed secondary education, 12.43% (86 individuals) had a bachelor's degree, and 6.79% (47 individuals) had a master's degree. The 10.69% (74 individuals) were government employees, 23.12% (160 individuals) were private employees, 20.09% (139 individuals) were self-employed, 17.34% (120 individuals) were students, 7.66% (53 individuals) were retired, and 21.10% (146 individuals) were unemployed. About 28.90% (200 individuals) were single and 71.10% (492 individuals) were married. Only 44.22% (306 individuals) had a low socio-economic status, 41.91% (290 individuals) had a middle socio-economic status, and 13.87% (96 individuals) had a high socio-economic status.

Knowledge regarding Dengue Fever among people of different localities in District Khyber

In various localities and different Tehsils of Khyber facts of dengue were investigated in depth. Knowledge regarding dengue illness was proved highly significant in all of the four Tehsils of the district in accordance with almost all the design questions that were investigated from participants as value of P was <0.005 but it was not significant in these two terms as have you ever been victim of dengue fever? and regarding the role of plants in mosquitos' abundance which showed the value of $p=>0.005$.

Tehsil wise Attitudes for dengue fever among people of district Khyber

The attitudes of the inhabitants living in all the four Tehsils which are Landi Kotal, Jamrud, Bara, and Mullahgori of Khyber living there for the past 15 years and were of the age 18 and above. The attitudes of the people of district Khyber were proved very highly significant regarding all the aspects and the questions that were asked to record on the designed questionnaire. TV/Radio were the main sources of information for them so they were very cautious about the dengue disease and they showed almost positive attitude about spreading, fatality and condition of dengue. The value of Pearson chi square for the attitudes of the respondents of this study was given as $p=0.000$ which is highly significant among the people of all the four tehsils of district Khyber.

Tehsil wise Preventive Practices for dengue fever among people of district Khyber

The most commonly taken preventive steps for the prevention of dengue illness were investigated. The investigated results showed a very high significance in taking the preventive steps in order to control the spreading of dengue illness and to escape from it by taking all of the preventive measures seriously in each household of the four tehsils of Khyber.

The P value for Prevention of the dengue fever in district Khyber was recorded as 0.000 in all the questions asked from the residents of Khyber in the self-structured questionnaire which was lesser than the set P value (<0.05).

Overall result of KAP in district Khyber

The data shows the results of a Knowledge, Attitude, and Practice (KAP) survey regarding a particular topic. The sample size was 692 individuals. The results indicate that 61.56% of the participants had inadequate knowledge, while 38.44% had adequate knowledge. In terms of attitude, 40.3% of the participants had a poor attitude, while 59.7% had a good attitude. In terms of practice, 37.6% of the participants had poor practices, while 62.4% had good practices.

It is important to note that the results of the KAP survey provide valuable insights into the general understanding and behaviors of the target population. The findings can be used to design and implement targeted educational and behavioral interventions to improve knowledge, attitudes, and practices. Furthermore, conducting regular KAP surveys can provide information on the impact of such interventions over time.

Table 3 Knowledge of Dengue Fever among people of different localities of District Khyber

Knowledge of Dengue Fever	Area of Study				Chi Square P	
	Landi Kotal n (%)	Jamrud n (%)	Bara n (%)	Mullahgori n (%)		
Diseases Spread by Mosquitoes?	Malaria	47 (27.16)	6 (3.47)	40 (23.12)	23 (13.29)	0.000
	Dengue	28 (16.18)	4 (2.31)	28 (16.18)	25 (14.45)	
	Other	7 (4.04)	4 (2.31)	26 (15.03)	20 (11.56)	
	Both Malaria & Dengue	91 (52.60)	159 (91.91)	79 (45.66)	105 (60.69)	
Heard About Dengue Fever?	Yes	152 (87.86)	173 (100)	168 (97.11)	173 (100)	0.000
	No	21 (12.13)	0 (0)	5 (2.89)	0 (0)	
Have You Been Victim of Dengue Fever?	Yes	3 (1.73)	4 (2.31)	1 (0.58)	5 (2.89)	0.433
	No	170 (98.29)	169 (97.69)	172 (99.42)	168 (97.11)	
Most Life-threatening Sign of Dengue?	Bleeding	72 (41.61)	119 (68.79)	58 (33.53)	61 (35.26)	0.000
	Fever	33 (19.07)	16 (9.25)	23 (13.29)	23 (13.29)	
	Low Platelets	42 (24.27)	15 (8.67)	60 (34.68)	59 (34.10)	
	Shock	12 (6.93)	13 (7.51)	9 (5.20)	2 (1.16)	
	Don't Know	14 (8.09)	10 (5.78)	23 (13.29)	28 (16.18)	
	Mosquito	65 (37.57)	62 (35.84)	68 (39.31)	53 (30.64)	
	Dirty Drinking Water	45 (26.01)	28 (16.18)	44 (25.43)	33 (19.08)	
Dengue is Transmitted by Which Source?	Flies	19 (10.98)	13 (7.51)	23 (13.29)	28 (16.18)	0.000
	Dirty Environment	12 (6.93)	16 (9.25)	17 (9.83)	20 (11.56)	
	Unhygienic Food	27 (15.60)	32 (18.50)	5 (2.89)	13 (7.51)	
	Don't Know	5 (2.89)	22 (12.72)	16 (9.25)	26 (15.03)	
Symptoms for Dengue Fever	Prolonged Fever	26 (15.02)	25 (14.45)	48 (27.75)	65 (37.57)	0.000
	Muscular Pain	83 (47.97)	24 (13.87)	46 (26.59)	15 (8.67)	
	Rash	16 (9.24)	15 (8.67)	53 (30.64)	47 (27.17)	
	Bleeding	47 (27.16)	109 (63.01)	17 (9.83)	36 (20.81)	
	Headache/Nausea/Vomiting	0 (0)	0 (0)	9 (5.20)	10 (5.78)	
	Stomachache	1 (0.57)	0 (0)	0 (0)	0 (0)	
Have You Ever Heard the Name of Black Mosquito?	Yes	77 (44.50)	107 (61.85)	121 (69.94)	103 (59.54)	0.000
	No	96 (55.49)	66 (38.15)	52 (30.06)	69 (39.88)	
What are the Possible Breeding Places for Black Mosquito?	Field	31 (17.91)	44 (25.43)	43 (24.86)	45 (26.01)	0.000
	House	46 (26.58)	5 (2.89)	41 (23.70)	51 (29.48)	
	Forest	44(25.43)	69 (39.88)	33 (19.08)	38 (21.97)	
	Others	52 (30.05)	55 (31.79)	56 (32.37)	39 (22.54)	
	Summer	121 (69.94)	120 (69.36)	76 (43.93)	112 (64.74)	
In Which Season the Mosquitoes are in Abundance?	Winter	20 (11.56)	4 (2.31)	9 (5.20)	11 (6.36)	0.000
	Spring	27 (15.60)	11 (6.36)	49 (28.32)	8 (4.62)	
	Don't Know	5 (2.89)	38 (21.97)	39 (22.54)	42 (24.28)	
In Which Part of the Body Mosquito Bite?	Hands	26 (15.02)	3 (1.73)	31 (17.92)	27 (15.61)	0.000
	Feet	32 (18.49)	35 (20.23)	27 (15.61)	30 (17.34)	
	Any Exposed Part	100 (57.80)	131 (75.72)	99 (57.23)	92 (53.18)	
	Don't Know	15 (8.67)	4 (2.31)	16 (9.25)	24 (13.87)	

Is There Any Role of Plants in Mosquito Abundance?	High	100 (57.80)	120 (69.36)	111 (64.16)	121 (69.94)	0.174
	Little	63 (36.41)	47 (27.17)	50 (28.90)	43 (24.86)	
	Don't Know	10 (5.78)	6 (3.47)	12 (6.94)	9 (5.20)	
Can Dengue Transmit from an Infected Person to Normal Individual?	Yes	80 (46.24)	90 (52.02)	61 (35.26)	52 (30.06)	0.000
	No	26 (15.02)	1 (0.58)	25 (14.45)	28 (16.18)	
	Don't Know	67 (38.72)	82 (47.40)	87 (50.29)	93 (53.76)	
Who are Mostly at Risk of Getting Mosquitoes Bite?	Children	82 (47.39)	102 (58.96)	79 (45.66)	86 (49.71)	0.038
	Women	26 (15.02)	28 (16.18)	36 (20.81)	33 (19.08)	
	Young	40 (23.12)	24 (13.87)	40 (23.12)	24 (13.87)	
	Old	25 (14.45)	19 (10.98)	18 (10.40)	30 (17.34)	
	Flowing Clean Water	21 (12.13)	2 (1.16)	29 (16.76)	21 (12.14)	
What are the Most Common Breeding Sites?	Stagnant Clean Water	104 (60.11)	164 (94.80)	83 (47.98)	110 (63.58)	0.000
	Flowing Dirty Water	9 (5.20)	2 (1.16)	15 (8.67)	10 (5.78)	
	Stagnant Dirty Water	30 (17.34)	1 (0.58)	15 (8.67)	10 (5.78)	
	Hot Water	3 (1.73)	1 (0.58)	6 (3.47)	4 (2.31)	
	Don't Know	6 (3.46)	3 (1.73)	25 (14.45)	18 (10.40)	
	Sunset	52 (30.05)	65 (37.57)	56 (32.37)	52 (30.06)	
At Which Time Mosquito Bites Frequently?	Sunrise	23 (13.29)	9 (5.20)	19 (10.98)	17 (9.83)	0.003
	Day	21 (12.13)	29 (16.76)	17 (9.83)	33 (19.08)	
	Night	58 (33.52)	65 (37.57)	62 (35.84)	47 (27.17)	
	Don't Know	19 (10.98)	5 (2.89)	19 (10.98)	24 (13.87)	
	Yes	137 (79.19)	171 (98.84)	100 (57.80)	108 (62.43)	
Is Dengue Preventable?	No	18 (10.40)	1 (0.58)	22 (12.72)	24 (13.87)	0.000
	Don't Know	18 (10.40)	1 (0.58)	51 (29.48)	41 (23.70)	
	Yes	60 (34.68)	41 (23.70)	35 (20.23)	48 (27.75)	
Is Vaccination Available for Dengue?	No	47 (27.16)	68 (39.31)	60 (34.68)	35 (20.23)	0.000
	Don't Know	66 (38.15)	64 (36.99)	78 (45.09)	90 (52.02)	
	TV/Radio	91 (52.60)	146 (84.39)	122 (70.52)	115 (66.47)	
What is the Source of Your Information?	School	20 (11.56)	0 (0)	7 (4.05)	10 (5.78)	0.000
	Hospitals	16 (9.24)	0 (0)	8 (4.62)	6 (3.47)	
	Newspapers	46 (26.58)	27 (15.61)	36 (20.81)	42 (24.28)	

Table 4 Tehsil wise Attitudes for dengue fever among people of district Khyber

Attitudes for Dengue Fever		Area of Study				Chi Square P
		Landi Kotal n (%)	Jamrud n (%)	Bara n (%)	Mullahgori n (%)	
Dengue is a Serious Illness	Strongly Agree	88 (50.86)	77 (44.51)	74 (42.77)	81 (46.82)	0.000
	Agree	74 (42.77)	95 (54.91)	69 (39.88)	62 (35.84)	
	Not Sure	10 (5.78)	1 (0.58)	24 (13.87)	21 (12.14)	
	Disagree	1 (0.57)	0 (0)	4 (2.31)	5 (2.89)	
	Strongly Disagree	0 (0)	0 (0)	2 (1.16)	4 (2.31)	
Level of the Danger of the Dengue Fever:	Very Dangerous	30 (17.34)	58 (33.53)	51 (29.48)	71 (41.04)	0.000
	Dangerous	125 (72.25)	115 (66.47)	103 (59.54)	92 (53.18)	
	Not Dangerous	18 (10.40)	0 (0)	19 (10.98)	10 (5.78)	
You are at risk of getting dengue	Strongly Agree	30 (17.34)	7 (4.05)	16 (9.25)	21 (12.14)	0.000
	Agree	70 (40.46)	73 (42.20)	44 (25.43)	41 (23.70)	
	Not Sure	53 (30.63)	69 (39.88)	97 (56.07)	92 (53.18)	
	Disagree	19 (10.98)	24 (13.87)	14 (8.09)	16 (9.25)	
	Strongly Disagree	1 (0.57)	0 (0)	2 (1.16)	3 (1.73)	
Dengue Fever Can be Prevented	Strongly Agree	96 (55.49)	108 (62.43)	77 (44.51)	95 (54.91)	0.000
	Agree	67 (38.72)	64 (36.99)	58 (33.53)	41 (23.70)	
	Not Sure	7 (4.04)	1 (0.58)	27 (15.61)	28 (16.18)	
	Disagree	1 (0.57)	0 (0)	6 (3.47)	5 (2.89)	
	Strongly Disagree	2 (1.15)	0 (0)	5 (2.89)	4 (2.31)	
Dengue Fever Needs Treatment and Hospitalization	Strongly Agree	100 (57.80)	110 (63.58)	90 (52.02)	107 (61.85)	0.009
	Agree	56 (32.36)	59 (34.10)	53 (30.64)	50 (28.90)	
	Not Sure	11 (6.35)	4 (2.31)	25 (14.45)	12 (6.94)	
	Disagree	3 (1.73)	0 (0)	2 (1.16)	2 (1.16)	
	Strongly Disagree	3 (1.73)	0 (0)	3 (1.73)	2 (1.16)	
The Govt. is Responsible for Controlling the Breeding of Mosquitos	Strongly Agree	110 (63.58)	164 (94.80)	125 (72.25)	111 (64.16)	0.000
	Agree	33 (19.07)	8 (4.62)	36 (20.81)	44 (25.43)	
	Not Sure	22 (12.71)	1 (0.58)	12 (6.94)	16 (9.25)	
	Disagree	2 (1.15)	0 (0)	0 (0)	2 (1.16)	
	Strongly Disagree	6 (3.46)	0 (0)	0 (0)	0 (0)	
What is Your Opinion About Last Year's Impact?	Afraid	109 (63.00)	120 (69.36)	65 (37.57)	71 (41.04)	0.000
	Not Afraid	32 (18.49)	34 (19.65)	46 (26.59)	45 (26.01)	
	No Concern	25 (14.45)	16 (9.25)	42 (24.28)	41 (23.70)	
	None	7 (4.04)	3 (1.73)	20 (11.56)	16 (9.25)	
Your view about future probability of dengue spread?	High Chance	94 (54.33)	113 (65.32)	84 (48.55)	60 (34.68)	0.000
	Little Chance	43 (24.85)	30 (17.34)	53 (30.64)	69 (39.88)	
	No Chance	36 (20.80)	30 (17.34)	36 (20.81)	44 (25.43)	

Table 5 Practices for dengue fever among the people of district Khyber

Practices for Dengue Fever		Area of Study				Chi Square P	
		Landi (%)	Kotal n	Jamrud n (%)	Bara n (%)		
What Measures You Take for Prevention of Mosquito Bites?	Mosquito Spray/ Mat/ Coil/ Vaporizer	90 (52.02)		89 (51.45)	60 (34.68)	40 (23.12)	0.000
	Net	17 (9.82)		18 (10.40)	28 (16.18)	29 (16.76)	
	Window/Door Screen	25 (14.45)		36 (20.81)	19 (10.98)	25 (14.45)	
	Cleaning House	23 (13.29)		4 (2.31)	22 (12.72)	27 (15.61)	
	Use of Smoke	6 (3.46)		11 (6.36)	12 (6.94)	19 (10.98)	
	Prevent Water Stagnation	4 (2.31)		9 (5.20)	17 (9.83)	17 (9.83)	
	Environmental Sanitation	8 (4.62)		6 (3.47)	15 (8.67)	16 (9.25)	
Do You Store Water at Home?	Yes	73 (42.19)		11 (6.36)	105 (60.69)	89 (51.45)	0.000
	No	100 (57.80)		162 (93.64)	68 (39.31)	84 (48.55)	
If Yes, Do You Frequently Change Water?	Yes	64 (36.99)		10 (5.78)	101 (58.38)	80 (46.24)	0.000
	No	109 (63.00)		163 (94.22)	72 (41.62)	93 (53.76)	
Are Windows and Doors of Your House Properly Screened?	Yes	116(67.05)		105 (60.69)	152 (87.86)	103 (59.54)	0.000
	No	57 (32.94)		68 (39.31)	21 (12.14)	70 (40.46)	
Are Mosquito Repellants, Coils, and Sprays Easily Available in Your Area?	Yes	143 (82.65)		170 (98.27)	147 (84.97)	148 (85.55)	0.000
	No	30 (17.34)		3 (1.73)	26 (15.03)	25 (14.45)	
What Could be Preventive Measures Against Dengue in Community?	Filling of Ditches	26 (15.02)		23 (13.29)	52 (30.06)	46 (26.59)	0.000
	Sprays	104 (60.11)		136(78.61)	94 (54.34)	98 (56.65)	
	Others	43 (24.85)		14 (8.09)	27 (15.61)	29 (16.76)	
Is Your Area Sprayed by Govt. or NGOs?	Yes	28 (16.18)		1 (0.58)	37 (21.39)	25 (14.45)	0.000
	No	145 (83.82)		172 (99.42)	136 (78.61)	148 (85.55)	
Which is most effective measure for control of dengue?	Spray Houses	46 (26.58)		0 (0)	71 (41.04)	37 (21.39)	0.000
	Spray on Breeding Sites	127 (73.41)		173 (100)	102 (58.96)	136 (78.61)	
	Frequently Changing Water	40 (23.12)		39 (22.54)	54 (31.21)	51 (29.48)	
	Proper Disposal of Waste	30 (17.34)		17 (9.83)	44 (25.43)	22 (12.72)	
	Tightly Covering Water Storage Containers	75 (43.35)		84 (48.55)	36 (20.81)	43 (24.86)	
	Fish	23 (13.29)		15 (8.69)	20 (11.56)	33 (19.08)	
Measures to Kill Larvae:	Adding Salt to the Water	5 (2.89)		18 (10.40)	19 (10.98)	24 (13.87)	0.000

Table 6 Overall result of knowledge, attitude and practices for dengue fever in district Khyber

Result of KAP	n	%
Knowledge		
Adequate	266	38.44
Inadequate	426	61.56
Attitude		
Good	413	59.7
Poor	279	40.3
Practice		
Good	432	62.4
Poor	260	37.6

Discussion

Dengue fever is world's most fastest circulating infectious disease caused by mosquitoes bite, infecting nearly 390 million individuals in the world (Bhatt et al., 2013). There is no treatment for Dengue currently but can only be controlled by symptomatic management, however the current vaccine shows some usefulness which is not able to provide protection against the 04 serotypes equally (Stanaway et al., 2016). Therefore, the mainstay for the control of dengue fever remains vector control. Efforts are required on health campaign for educating population regarding prevention of illness of dengue fever (Ghani et al., 2019).

Current research is based primarily on the knowledge, attitude and practices in Khyber, KPK concluded about dengue the values of significant difference ($p < 0.05$) in knowledge, attitude and practices. On the other hand, no significant difference was tabulated only in three variables of knowledge of dengue fever in "education about dengue fever is a good way to protect yourself", "have you ever been victim of dengue fever", and "is there any role of plants in mosquito abundance?" as $p = 0.081$, $p = 0.433$, and $p = 0.174$ accordingly, that was accordingly with the data of Khalil *et al.*, (2016) study that also showed no significant difference in the afore mentioned variables in both the groups they had studied as $p = 0.104$, 0.305 , 0.630 , respectively. In Khyber this may be due to the results of practices observing for preventing dengue illness were at a good level which protects and guards them from dengue's infection and they have prior knowledge regarding the spreading of dengue and the role of plants as well in mosquito abundance.

Current dengue study disclosed that knowledge, attitude and practices as well had clear variance to man demographic elements. Findings of this research showed significance for gender in knowledge and practices but no significance difference to the attitude towards dengue fever as $p = 0.006$, 0.243 , and 0.009 , respectively. The study was not in agreement with a study that was conducted by Kouroush (2018) in Iran between the two genders in preventive practices for the dengue fever showed no significant difference in knowledge, attitude, and practices as $p = 0.390$, 0.510 and 1.000 , respectively, that was not significant in males and females (Kouroush *et al.*, 2018). It was due to the fact that male inhabitants of the study were depend on on the transportation for earnings and they had to travel to far cities while the females of the area are generally housewives and not educated.

Knowledge variable of the current study was nearly the same with a study in Malaysia having appropriate knowledge about infection of dengue fever while attitudes and practices of the participants of the study were way off better than that of the Malaysian village study conducted by Selvarajoo *et al.*, (2020) this is due to the reason that residential area is not urbanized which does not affect their resources availability for better preventive measures provided by the Govt. and the attitude was developed by the elders in a proper manner. Self-reporting and the most common symptom answers were not in agreement because people in this region were not prone to share their information openly.

Conclusion

The facts about dengue disease, its transmission mode, sign and symptoms of the disease and treatment as well were mostly known to the study participants. The best source of information was TV and Radio. The participants considered dengue disease as one of the fatal diseases and it is believed that the infection is prevented through various techniques and they consider dengue disease as more fatal compared to malaria. One of the most suitable measures for prevention from mosquito bite to avoid infection was the spraying proper insecticides, mosquito net, full clothing to cover all body parts and screening for door or window.

Provision of the mosquito nets may be scaled-up by the provincial malaria control program. Furthermore, more qualitative research in the area may be directed to investigate the elements that are related to the recent attitudes and practices of populations for a sustainable behavior and to develop effective prevention and control program against dengue.

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