Knowledge and Preventive Practices Regarding Dengue Fever in Nepal

Raju Khanal[1, *], Rewash Thapa[2], Madhav Khanal[2]

[1]Center Department of Health Education, Tribhuvan University, Kirtipur, Kathmandu, Nepal

[2]Chitwan Medical College, Bharatpur, Nepal

Email address:
mailkhanalraju@gmail.com (R. Khanal), thaparewash111@gmail.com (R. Thapa), khanalmadhav1@gmail.com (M. Khanal)
[*]Corresponding author

Abstract: Dengue is an acute infection disease caused by a flavi virus (species Dengue virus of the genus Flavi virus), transmitted by female mosquito aedes mosquito, infection has globally become a major public health concern since the incidence of the dengue fever has increased more than 30-fold over the last decades. The dengue fever has been a most important public health problems since many years and the various outbreak of the dengue cases has been seen time to time. One of the reasons for the increasing and time to time outbreak of the dengue may be the reason of climate change, global warming, lack of knowledge about signs, symptoms, transmission, preventive measure and lack of ignorance or lack of the preventive practice of the dengue fever. Descriptive, cross-sectional study on 192 head of household's was study population residing in Kanchan RM, Rupandehi District. Respondent was selected using Non probability judgmental sampling techniques by face-to-face interview was used. Result shows 58.3% good knowledge and 62% good practice. Knowledge was found to be associated with Age, Types of family, Size of family, educational level and Family suffered from dengue. Preventive practice was found to be associated with the Ever heard from health professional. Study will contribute towards development of appropriate policy strategies at local level that will tackle the problem associated with the knowledge and preventive practice of DF and provide a basis for future research on this area. Inferential analysis shows that there is significant association between the level of knowledge with age, types of family, size of family, educational level and family suffered from dengue and the level of preventive practice was associated with the ever heard from health professional.

Keywords: Flavi Virus, Fever, Symptom, Prevention, Female Mosquito, Climate Change

1. Introduction

Dengue is an acute infection disease caused by a flavi virus (species Dengue virus of the genus Flavi virus), transmitted by female mosquito aedes mosquito, which is characterized by several joint pains, headache, and a rash-called also break bone fever, dengue fever. [1]. WHO (2009) classified dengue as i) Dengue without warning signs ii) Dengue with warning sign and iii) severe dengue [2] Dengue causes wide spectrum of diseases; this can range from subclinical disease to severe flu-like symptoms in those infected [3] It must be suspected when there is a high fever (40/104°F) and accomplished by two of the following symptoms; pain behind the eyes, several headache, nausea, muscle and joint pain, vomiting, swollen glands or rash Symptoms usually last for 2-7 days, after an incubation period of 4-10 days after the bite from an infected mosquito. [1] Dengue is estimated to infect 390 million people annually of which 96 million manifests clinically. One study on prevalence of dengue estimates that 3.9 million people in 128 countries had experienced severe dengue epidemics, today the diseases is found to be endemic in more than 100 countries. [4]. Aedes aegypti bites primarily during the day. This species is most active for approximately two hours after sunrise and several hours before sunset, but it can bite at night in well lit areas. This mosquito can bite people without being noticed because it approaches from behind and bites on the ankles and elbows. Aedes aegypti prefers biting people and only females bite to obtain blood in order to lay eggs. [5]

There is no any specific treatment against DF. Thus, controlling the population of dengue virus vector mosquitoes, especially Ades aegypti and Ades albopictus, and limiting their dispersal to new region is crucial to prevent DENV transmission. [6]. Also, there is no vaccine to prevent human infection by the virus. environment management and personal protection of mosquito are essential for the prevention of dengue. prevention is the one of the important way and prevention means avoiding the bites from mosquito. The effective way to reduce mosquito is to eliminate the breeding place of the mosquito like the manmade container where there can be the collected water and around the home. outdoor clean, vases with fresh flower and must be clean at least once a week. The adult mosquito usually found inside as well as around the homes, during the day and the night when lights are on. To protect self, use of long sleeves and pants, use of repellent, and others mechanical ways can help in diseases prevention. [1]

Global and regional scenario: There was a large dengue outbreak worldwide in 2016. [1] The incidence of dengue has been increasing greatly around the world in recent decades. This disease is now endemic in more than 100 countries in the regions of Africa, America, Eastern Mediterranean, South East Asia and Western Pacific. The region of the America, South East Asia and western pacific are the most affected. there is increasing number of dengue cases and also many outbreaks in recent years. however, many countries are able to reduce the case fatality rate less than 1% and globally, 28% decline in case fatality have been recorded between the period of 2010-2016, due to improvement in case management through capacity building in countries. [4]. The number of dengue cases reported to WHO increased over 8-fold over the last two decades, from 505430 cases in 2000, to over 2.4 million in 2010, and 4.2 million in 2019. Death rate had increased from 960 to 4032 between year 2000 to 2015. National scenario: Dengue has been identified as one of the youngest emerging infectious diseases in Nepal whose first case of dengue was reported in 2004. [4] The number of dengue cases has significantly increased from 1527 in FY 2073/74 to 2111 in FY 2074/75. During FY 2074/75, dengue cases were reported from 28 districts. The majority of the cases have been reported from Rupandehi (32%), Jhapa (25%), Mahottari (20%) and Sarlahi (6%). As well as 3 confirm deaths due to Dengue- one each from Chitwan, Jhapa and Arghakhanchi. [2]

2. Problem of Statement

Dengue Virus (DENV) mostly occurs in tropical and sub-tropical regions worldwide and is the most widespread and common arboviral infection of human. DENV infection typically results in tens of millions of clinical cases of dengue disease yearly, causing an enormous health, social and economic burden, mostly in low and middle-income countries. [7]. Dengue is the one of the Neglected Tropical vectors borne diseases which affect the millions of the population. Dengue is however, expanding rapidly geographically with increased frequency and magnitude of outbreak [12]. According to WHO severe dengue is a leading cause of serious illness and death in some Asian and Latin American. About half of world's population is now at risk [3]. One of the studies in Nepal estimates that the percentage of the risk population will increase from the current 70% to 90% in the future due to climate change which suggest for effective surveillance and control strategies of dengue fever in Nepal. [13]

There was significant increase in the prevalence of cases in 2019 as compare to 2018. [8]. The prevalence cases have always grown up from the decades. About half of the world's population is now at risk. There are an estimated 100-400 million infection each year. One modelling estimates indicates 390 million dengue virus infection per year, of which 96 million is manifested clinically (with any severity of diseases). Another study on the dengue prevalence study had estimated that 3.9 billion people are at risk of infection with dengue virus. Despite of the risk of infection in the existing 129 countries, 70% of the actual burden is in Asia [3]

According to the ministry of health and population 2076/77 (shrawn 1st to kartik 18th), there was 14662 total cases were reported where the highest cases were found in the province-3 (7151), likewise province-5 comes in second highest in dengue cases (1977), third highest was in the province-1 (1246), similarly in province-2 (268), Sudurpachim province (140), and karnali province (73) were reported. Similarly, 6 deaths were reported from each six districts (Sindupalchowk, Chitwan, Kathmandu, Doti and Sunsari).[9] Since the dengue is also increasing globally and nationally, this research may help to access how well knowledge people have regarding dengue and how well they apply preventive practice to prevent from dengue fever. So, the research and finding may help to design various programs, policies and also help for further research for the effective prevention and control of dengue globally and nationally About one in four people infected with dengue will get sick, severe dengue can be life threatening and need a hospital care. Since, there is no any specific treatment for the dengue, so prevention is most. [10]. So, people must be aware about the knowledge and preventive practice behavior which is must important in the dengue prevention.[6]. A study done in Jhapa shows that 85.3% had medium knowledge regarding dengue and more than 54.1% respondent had poor preventive practice. [1]. Similarly, the study done in the Pakistan shows that, many people knew about the knowledge of dengue but they did not practice preventive behavior. [11].

3. Objectives

General objective: To assess the knowledge and preventive practice regarding dengue fever among community people Specific objectives:

1) To find out the level of knowledge regarding dengue fever among community people.
2) To identify the level of preventive practice of community people for the prevention of dengue.
3) To measure the association between level of knowledge and some explanatory variables.

4. Literature Review

A descriptive cross-sectional study done in Jhapa district, Nepal by Suraksha subedi, Sanjeev shah in 2018 conducted a non-probability purposive sampling technique collected data among 109 household through face-to-face interview with the semi-structured questionnaire found that, Maximum 85.3% and 14.7% of the respondent had medium and high knowledge about Dengue respectively. More than half (54%) had poor practice, 41.3% had fair and 4.6% had least (4.6%) of the respondent had good preventive practice. There was association between knowledge, age and occupation of the respondent and preventive practices. They concluded that Majority of the respondent had medium knowledge level on Dengue while the overall preventive practices were below average. Hence, health education and awareness program can be launched to upgrade existing knowledge and its preventive practices.

Household based, cross-sectional study conducted in three urban districts encompassing 383 household in Yeman by Thaker A. A. Alyousefi, Rashad Abdul-Ghani in 2015 found that more than 90.0% of respondent household heads had correct knowledge about fever, headache and joint pain as common signs and symptoms of dengue fever. Moreover, muscular pain and bleeding were perceived by more than 80.0% of the respondents as being associated with dengue fever; however, only 65.0% of the respondents reported skin rash as a sign of dengue fever. More than 95.0% of respondents agreed about the Seriousness and possible transmission of dengue fever; however, negative attitudes regarding the facts of being at risk of the disease and that the infection is preventable were expressed by 15.0% of respondents. Despite the good level of knowledge and attitudes of the respondent population, poor preventive practices were common. Bivariate analysis identified poor knowledge of dengue signs and symptoms (OR=2.1, 95% CI=1.24–3.68; P=0.005) and its vector (OR=2.1, 95CI=1.14–3.84; P=0.016) as factors significantly associated with poor preventive practices. However, multivariable analysis showed that poor knowledge of the vector. They concluded that they had a good knowledge of dengue but had not good preventive practice and suggest for the future studies for the identification of the existing gap in knowledge and practice for prevention of dengue fever. [14]

A cross-sectional study conducted in Philippines by Begonia C. Yboa, Leodoro J. Labrague (2013) among 646 respondents found that more than half of the respondents had good knowledge (61.45%) on causes, signs and symptoms, mode of transmission, and preventive measures about dengue. More than half of the respondents used dengue preventive measures such as fans (n=340, 52.63%), mosquito coil (n=458, 70.90%), and bed nets (n=387, 59.91%) to reduce mosquitoes while only about one third utilized insecticides sprays (n=204, 31.58%) and screen windows (n=233, 36.07%) and a little portion used professional pest control (n=146, 22.60%). They also found that Knowledge about dengue fever did not necessarily translate to improve preventive measures. [15]. Cross-sectional study was conducted by Md.

Imam Hossain, Nur-E-Alam with 1,010 randomly selected participants from nine different administrative regions of Bangladesh between July and November 2019 using a well-structured questionnaire used covering socio-demographic characteristics of the participants including their knowledge, awareness, treatment and practices regarding Dengue fever. Found that majority (93.8%) of the participants had heard about dengue, however, they had still misconceptions about Aedes breeding habitat. Around half of the study population (45.7%) had mistaken belief that Aedes can breed in dirty water and 43.1% knew that Aedes mosquito usually bites during sunrise/sunset. Fever indication was found in 36.6% of people which is the most common symptom of dengue. Living place, literacy and employment status were found significantly associated (p<0.05) with knowledge and awareness of dengue fever. The preventive practice level was moderately less than the knowledge level though there was a significant association (p<0.05) existed between knowledge and preventive practices. [16]

A community based cross-sectional study was carried out among the purposively selected 196 participants to ascertain community knowledge, awareness and practices on dengue fever among the rural residents in Golapganj Upazila, by Nurunnabi M, Rahman T, Hasan F in 2019 found that almost 61% of the individuals knew mosquito bite causes dengue fever, among them 40.83% knew that Aedes mosquito as vector. Fever (53.7%) was recognized as a primary symptom of dengue fever. Majority of them (58.16%) responded the probable breeding sites is stagnant water.

Removal of water stagnation (40.31%) and use of bed net (61.73%) was cognizant most effective preventive and control measures. About 90% of the individual were aware of health seeking for dengue. The most commonly using protective measures were bed nets (47.96%) and removal of water stagnation (31.12%). They concluded that the awareness on dengue fever found good but knowledge and preventive practices were considerably low. It could be improved through increase community participation and educational campaigns. [17]Muhammad Faridzuan Faiz Said, Hasmah Abdullah among 132 respondents living in a dengue hot spot area in Malaysia in 2018 found that more than half of the respondents possessed good level of attitude, and more than half scored moderately for practice (57.6% and 56.1% respectively) also found that Level of practice of dengue prevention is still considerably low.[18] Community based cross-sectional survey in five districts of Nepal was done in between 2011 and 2012 by Meghnath Dhimal, Krishna Kumar Aryal, collected information on the socio demographic, characteristics of the participants and their knowledge and practice regarding Dengue fever using a structured questionnaire found that out of 589 individuals interviewed, 77% had heard of DF. Only 12% of the sample had good knowledge of DF. Those living in the lowlands were five times more likely to possess good knowledge than highlanders (P,0.001).

Despite low knowledge levels, 83% of the people had good attitude and 37% reported good practice. They found a significantly positive correlation among knowledge, attitude

and practice (P,0.001). Among the socio-demographic variables, the education level of the participants was an independent predictor of practice level (P,0.05), and education level and interaction between the sex and age group of the participants were independent predictors of attitude level (P,0.05) and concluded with low level of knowledge of people about dengue fever. [6] A community based cross-sectional study conducted by Ms heera kc in 2013 found that dengue awareness was not adequate and preventive practice was not satisfactory [19].

5. Methodology

Descriptive cross-sectional study was used to access level of knowledge and level of preventive practice of Dengue fever among the community people of Kanchan RM, Rupandehi district which is prone for dengue virus, of various categories such as religions, ethnicities, social class, and family status. The site had been chosen because it is terai area which is prone for the dengue fever and limited studies has been done in this area. study population was community peoples residing in Kanchan RM which consist of total 9503 house hold consisting 5 wards and total population of 40533 (according to Kanchan RM). Non probability judgmental sampling techniques was used to collect the sample size as estimated in the Kanchan RM 95% C. I level and 7% allowable error. Using formula of sample size estimation for infinite population. $n = \frac{Z^2 pq}{d^2}$ Cochran formula (1997) where, Z=Standard normal deviate=1.96 for 95% confidence interval A study conducted in Jhapa, Nepal 2019 reported that 54% had poor practice on dengue prevention So p=0.54 [1] then the optimum sample size will be $n = \frac{(1.96)^2 \times 0.54 \times 0.46}{(0.07)^2} = 195$ For the finite population, where N=9503 $n = \frac{no}{1 + \frac{no-1}{N}}$ so the sample population is $n = \frac{195}{1 + \frac{195-1}{9503}} = 192$ Individual of a household head or others any more than 18 years was chosen who was mentally stable members who are capable to answer.

Participants absent at the time of data collection, were excluded from the study. Participants who had not given consent for participation in the survey was not included in the survey. Dependent Variable: Knowledge and preventive practice regarding dengue fever. Independent Variables: Socio Demographic factors Education level, Level of knowledge regarding DF and Preventive practice. quantitative method and Face to face interview technique was carried out for the data collection. Semi-structured Interview schedule was used for the data collection. Content validity was be achieved by using items from the previously validated surveys, by developing items based on an extensive literature search and by frequently reviewing the questions with faculties and supervisor. Pre-testing was done in 10% of sample and necessary improvements was made. Study was limited on the face-to-face interview, interview schedule about the knowledge and preventive practice. purpose and process of the study were clearly explained to the participants before data collection. Privacy and confidentiality of the participants was assured and maintained. Respondent were informed of their full right to skip or ignore any question or withdraw from their participation at any stage. Data management and analysis was done in IBM-SPSS version 20. Descriptive and inferential analysis will be done with the subject expert.

6. Discussion and Analysis

Socio-demographic profile of the participants participated in the study. Among 192 participants, it was found that 94 (49%) were below the age of 39 years followed by 70 (36.5%) were between the age 40-59 and 28 (14.6%) were above 60. The media age was found to be 40 years and the Minimum age was 19 years and maximum age was 76 years and the IQR was found to be 25 (57.8%) were Female and 81 (42.2%) were male. Majority of the religion followed by the respondent was Hindu 147 (76.6%), followed by the Buddhist 37 (19.3%), Christian was 5 (2.6%) and Islam was 3 (1.6%). (53.6%) janjati, like wise Brahmin/Chhetri were found to be 57 (29.7%), Dalit were found to be 27 (14.1%) and Madhesi were 5 (2.6%). 98 (51%) had monthly income more than 20,000 and 93 (48.4%) had less than 20,000 monthly incomes. Agriculture was the main occupation (54.7%), like wise foreign service were 40 (20.8%), Business was followed by 32 (16,7%), service was followed by 13 (6.8%) and housewife were found to be 2 (1%). Majority of the respondent had joint/extended types of family of 115 (59.9%) likewise Nuclear were 77 (40.1%). 159 (82.8%) were married, 27 (14.1%) were unmarried and 6 (3.1%) were widow.111 (57.8%) whose family size were less than 5 and 81 (42.2%) whose family size were more than 5, median was 5, IQR was 2, Minimum was 2 and maximum was 14. 90 (46.6%) were secondary and above education, like wise 58 (30.2%) were primary and below education and 44 (22.9%) were illiterate.

Table 1. Socio-demographic characteristics (n=192).

	Frequency	Percentage
		Variables
Age (in years)		
0-39	94	49
40-59	70	36.5
>60	28	14.6
Median=40, IQR=25,		*Min.=19, Max.=76*
Sex		
Male	81	42.2

| | Frequency | Percentage |
Variables		
Female	111	57.8
Religion		
Hindu	147	76.6
Buddhist	37	19.3
Islam	3	1.6
Christian	5	2.6
Ethnicity		
Brahmin/Chhetri	57	29.7
Janjati	103	53.6
Dalit	27	14.1
Madhesi	5	2.6
Family monthly income		
<20,000	93	48.4
≥20,000	98	51
Median=20000, IQR=22000, Min.=1300,		
Max.=100000		
Occupation		
Agriculture	105	54.7
Business	32	16.7
Service	13	6.8
Foreign service	40	20.8
Housewife	2	1
Types of family		
Nuclear	77	40.1
Joint/Extended	115	59.9
Marital status		
Married	159	82.8
Unmarried	27	14.1
Widow	6	3.1
Size of family		
≤5	111	57.8
>5	81	42.2
Median=5, IQR=2, Min.=2, Max.=14		
Educational status		
Illiterate	44	22.9
Primary and below	58	30.2
Secondary and above	90	46.9

Source of information about the Dengue fever heard by the respondent The sources of information regarding the Dengue fever from the different sources heard by the Kanchan RM people among 192 respondents. Out of the total respondents 19 (9.9%) respondent had suffered from the dengue or had family dengue history likewise 173 (90.1%) had no dengue history. Among them 52 (27.1%) had heard dengue form the health professionals likewise among the 192 respondent who had heard dengue from the media, TV was most media heard about dengue among respondent i.e., 68 (35.4%), like wise 31 (16.1%) heard about dengue from Radio and 30 (15.6%) had heard dengue from the Internet. Among total respondent 152 (79.2%) had heard dengue from friends or Neighbor.

Table 2. *Source of information of the Dengue fever by the respondent (n=192).*

Statement	Frequency	percentage
Has anyone from family suffered from Dengue		
Yes	19	9.9
No	173	90.1
Have you ever heard about dengue from any health professionals		
Yes	52	27.1
No	140	72.9
Have you ever heard about dengue from a kind of media, if yes which one as mentioned		
No	63	32.8
TV	68	35.4
Radio	31	16.1
Internet	30	15.6
Have you ever heard about dengue from friends or neighbour		
Yes	152	79.2
No	40	20.8
Any others source		
No	192	100

Respondent knowledge regarding the Dengue Fever

Table shows the knowledge of the Dengue regarding the signs/symptoms, transmission and knowledge on prevention of DF among the total respondent of Kanchan RM. Among the total respondent, 144 (75%) had correct knowledge regarding the fever is the symptoms of DF, like wise 130 (67.7%) had correct knowledge about the headache is the symptoms of DF among total respondents, 85 (44.3%) had correct knowledge regarding the muscle pain is the symptoms of DF, 47 (24.5%) had correct knowledge about the pain behind eye as a symptoms of DF, 52 (27.1%) had correct knowledge regarding the nausea and vomiting as a symptoms, 39 (20.3%) had correct knowledge regarding the rash as the symptoms of DF among the total respondents, 43 (22.4%) has correct knowledge regarding the stomach as a symptoms of DF, 48 (25%) had correct knowledge regarding the diarrhea as a symptoms of DF. Among the total respondents about the knowledge regarding the dengue fever transmission, 68 (35.4%) had correct knowledge regarding the about the can all mosquito transmit DF, likewise 31 (16.1%) had correct knowledge about Ades Mosquito transmit DF, 38 (19.8%) had correct knowledge regarding the files transmit Dengue, 57 (29.7%) had a correct knowledge regarding the Tick transmission on Dengue, 82 (42.7%) had a correct knowledge regarding the person to person dengue transmission among total respondents, 49 (25.5%) had correct knowledge regarding the dengue transmission through food and water, 110 (57.3%) had a correct knowledge regarding the transmission of dengue from blood transfusion, 84 (43.8%) had a correct knowledge regarding the dengue biting time mostly at day time. Among the total respondent regarding the knowledge on the prevention of DF, 137 (71.4%) had correct knowledge regarding the mosquito breed in the standing water, 140 (72.9%) knew window screen and bed-net reduce mosquito, 98 (51%) knew insecticide spray reduce the mosquito, 101 (52.6%) knew tightly covering water container prevent mosquito breeding, 51 (26.6%) knew mosquito repellent prevents Mosquito bites and 12 (6.3%) could identify Ades's mosquito.

Table 3. Respondent knowledge on Dengue fever (n=192).

Statements	Correct knowledge	
	Frequency	Percentage
Knowledge on Symptoms of DF		
Fever is a symptom of DF	144	75
Headache is a symptom of DF	130	67.7
Muscle pain is a symptom of DF	85	44.3
Pain behind eye is a symptom of DF	47	24.5
Joint pain is a symptom of DF	46	24
Nausea and vomiting are the symptoms of DF	52	27.1
Rash is a symptom of DF	39	20.3
Stomach pain is common in DF	43	22.4
Diarrhoea is common in DF	48	25
Knowledge of DF transmission		
All mosquito transmits DF	68	35.4
Ades Mosquito transmit DF	31	16.1
Flies transmits DF	38	19.8
Tick transmit DF	57	29.7
Ordinary person to person transmits DF	82	42.7
Dengue is transmitted through food and water	49	25.5
Dengue is transmitted through blood transfusion	110	57.3
Dengue mosquito are most likely to feed day time	84	43.8
Knowledge on the Prevention of DF		
Mosquito breed in standing water	137	71.4
Window screen and bed-net reduce mosquito	140	72.9
Insecticide's spray reduces the mosquito a prevent DF	98	51
Tightly covering water containers reduce mosquito	101	52.6
Removal of standing water prevent mosquito breeding	100	52.1
Mosquito repellent prevent mosquito bite	51	26.6
Identify Ades mosquito	12	6.3

Practice against Dengue fever among the community of Kanchan RMT the preventive practice of dengue followed by the community people of Kanchan RM among the 192 households. Among the total respondent 39 (20.3%) people use insecticides spray to reduce mosquito, 49 (25.5%) use window screen, 5 (2.6%) use professional pests, 53 (27.6%) eliminate standing water around house, 104 (54.2%) cut down bushes in the Yard, 67 (34.9%) prevent water stagnation, 3 (1.6%) uses mosquito eating fish, 165 (85.9%) use mosquito coils to reduce mosquito, 74 (38.5%) clean garbage/trash, 79 (41.1%) dispose water holding containers, 18 (9.4%) use mosquito repellent cream, 138 (71.9%) uses fan to drive away mosquito, 119 (62%) use smoke to drive away mosquito, 110 (57.3%) use long clothes to cover all

body parts to prevent bite from mosquito, 87 (45.3%) cover water container in the house, 70 (36.5%) clean water filled container and ditches around the houses, 75 (39.1%) turn

container upside and downside to avoid water collection, 184 (95.8%) use mosquito bed.

Table 4. *Respondent Preventive Practice against DF (n=192).*

Statements	Correct Practice	
	Frequency	Percent
Use of insecticides spray to reduce mosquito	39	20.3
Use of window screen to reduce mosquito	49	25.5
Use of professional pests' control to reduce mosquito	5	2.6
Eliminate standing water around the house to reduce mosquito	53	27.6
Cut down bushes in the yard to reduce mosquito	104	54.2
Prevent water stagnation	67	34.9
Use mosquito eating fish to reduce mosquito	3	1.6
Use mosquito coils to reduce mosquito	165	85.9
Clean your garbage/trash to reduce mosquito	74	38.5
Dispose water holding containers such as tires, parts automobiles, plastic bottles, cracks pots etc.	79	41.1
Use mosquito repellent cream	18	9.4
Use of fan to prevent bite of mosquito	138	71.9
Use smoke to drive away mosquito	119	62
Use long clothes to cover all body to prevent bite from mosquito	110	57.3
Cover water container in the house	87	45.3
Clean water filled containers and ditches around the house	70	36.5
Turn container upside and downside to avoid water collection	75	39.1
Use of mosquito bed-net	184	95.8

The level of knowledge of the respondent on the Dengue fever. *S*tudy revealed that the good knowledge was found to be 58.3% and poor knowledge was found to be 41.7%.

Table 5. *Level of Knowledge of respondent on Dengue Fever (n=192).*

Level of knowledge	Frequency	Percentage
Poor knowledge	80	41.7
Good knowledge	112	58.3

Median score=9, IQR=6, Min.=0, max.=20

Respondent level of knowledge the level of preventive practice of the respondent on the Dengue fever. This study revealed that good practice was found to be 62% and poor practice was found to be 38%.

Table 6. *Level of Practice of respondent on Dengue Fever (n=192).*

Level of practice	Frequency	Percentage
Poor Practice	73	38.0
Good practice	119	62.0

Median score=7, IQR=5, Min.=2, Max.=17

Association between level of knowledge of DF and socio-demographic variables

Table number 7 shows the association between the level of knowledge and socio-demographic variables. The level of knowledge regarding the Dengue fever is statistically significant with Age (P=<0.001), Types of family (P=0.007), Size of family (P=0.040), Educational level (P=<0.001).

Table 7. *Association between Level of knowledge about DF and Socio-Demographic variables (n=192).*

Variables	Level of Knowledge			
	Good No. (%)	Poor No. (%)		P-value
Age				
0-39	70 (74.5%)	24 (25.5%)	23.017	<0.001*
40-59	34 (48.6%)	36 (51.4%)		
>60	8 (28.6%)	20 (71.4%)		
Sex				
Male	50 (61.7%)	31 (38.3%)	0.664	0.415
Female	62 (55.9%)	49 (44.1%)		
Religion				
Hindu	86 (58.5%)	61 (41.5%)	0.007	0.931
Non-Hindu [a]	26 (57.8%)	19 (42.2%)		
Ethnicity				
Janjati	61 (59.2%)	42 (40.8%)	0.72	0.788
Non-janjati[aa]	51 (57.3%)	38 (42.7%)		
Family monthly income				
<20000	52 (55.9%)	41 (44.1%)	0.555	0.456
≥20000	60 (61.2%)	38 (38.8%)		
Occupation				
Agriculture	59 (56.2%)	46 (43.8%)	0.438	0.508
Non-Agricultura[l]	53 (60.9%)	34 (39.1%)		

Variables	Level of Knowledge			P-value
	Good No. (%)	Poor No. (%)		
Types of family				
Nuclear	54 (70.1%)	23 (29.9%)	7.360	0.007*
Joint/Extended	58 (50.4%)	57 (49.6%)		
Marital status				
Married	89 (56%)	70 (44%)	2.117	0.146
Other than married [aaaa]	23 (69.7%)	10 (30.3%)		
Size of Family				
<5	53 (67.1%)	26 (32.9%)	4.233	0.040*
≥5	59 (52.2%)	54 (47.8%)		
Educational level				
Illiterate	14 (31.8%)	30 (68.2%)	22.908	<0.001*
Primary and below [aaaa]	31 (53.4%)	27 (46.6%)		
Secondary and above	67 (74.4%)	23 (25.6%)		

*Significant level at 0.05 [a] non-hind includes Buddhist, Islam, Christian aa non-janjati includes Brahmin, Chhetri, Dalit, Madhesi [aaa] non-agriculture includes Business, Service, Foreign employment, Housewife [aaaa] Other than married include Unmarried, Divorced, Widow, Separated

Association between the level of knowledge about DF and source of information among the respondents of Kanchan RM.

Table number 8 shows the association between the level of knowledge about DF and source of information. The level of knowledge regarding the Dengue fever is statistically significant with Anyone in the family suffered from dengue (P=0.004).

Table 8. *Association between Level of knowledge about DF and Source of information (n=192).*

Variables	Level of knowledge			
	Good No. (%)	*Poor* No. (%)	X^2	P-value
Anyone in the family suffered from dengue				
Yes	17 (89.5%)	2 (10.5%)	8.413	0.004*
No	95 (54.9%)	78 (45.1%)		
Ever heard professionals from health				
Yes	31 (59.6%)	21 (40.4%)	0.048	*0.826*
No	81 (57.9%)	59 (42.1%)		
Heard dengue from any kinds of media (only yes n=129)				
TV	39 (57.4%)	29 (42.6%)		
Radio	18 (58.1%)	13 (41.9%)		
Internet	25 (83.3%)	5 (16.7%)		
Heard from friends or neighbour				
Yes	93 (61.2%)	59 (38.8%)	2.440	0.118
No	19 (47.5%)	21 (52.5%)		

*Significant level at 0.05

Association between the level of Preventive practice towards DF and socio-demographic among the respondent.
The association between the level of knowledge about DF and sociodemographic information.

Table 9. *Association between Level of practice against DF and Socio-Demographic variables (n=192).*

Variables	Level of Practice			P-value
	Good No. (%)	Poor No. (%)		
Age				
0-39	59 (62.8%)	35 (37.2%)	3.690	0.158
40-59	47 (67.1%)	23 (32.9%)		
>60	13 (46.4%)	15 (53.6%)		
Sex				
Male	49 (60.5%)	32 (39.5%)	0.131	0.717
Female	70 (63.1%)	41 (36.9%)		
Religion				
Hindu	94 (63.9%)	53 (36.1%)	1.029	0.310
Non-Hindu	25 (55.6%)	20 (44.4%)		
Ethnicity				
Janjati	64 (62.1%)	39 (37.9%)	0.002	0.962
Non-janjati[aa]	55 (61.8%)	34 (38.2%)		
Family monthly income				
<20000	52 (55.9%)	41 (44.1%)	3.151	0.076
≥20000	67 (68.4%)	31 (31.6%)		
Occupation				

Variables	Level of Practice			
	Good No. (%)	Poor No. (%)		P-value
Agriculture	62 (59%)	43 (41%)	0.845	0.358
Non-Agricultura[l]	57 (65.5%)	30 (34.5%)		
Types of family				
Nuclear	48 (62.3%)	29 (37.7%)	0.007	0.933
Joint/Extended	71 (61.7%)	44 (38.3%)		
Marital status				
Married	98 (61.6%)	61 (38.4%)	0.046	0.829
Other than married	21 (63.6%)	12 (36.4%)		
Size of Family				
<5	50 (63.3%)	29 (36.7%)	0.098	0.754
≥5	69 (61.1%)	44 (38.9%)		
Educational level				
Illiterate	21 (47.7%)	23 (52.3%)	5.616	0.060
Primary and below [aaaa]	36 (62.1%)	22 (37.9%)		
Secondary and above	62 (68.9%)	28 (31.1%)		

*Significant level at 0.05 [a] non-hind includes Buddhist, Islam, Christian aa non-janjati includes Brahmin, Chhetri, Dalit, Madhesi [aaa] non-agriculture includes Business, Service, Foreign employment, Housewife [aaaa] Other than married include Unmarried, Divorced, Widow, Separated

Association between the level of Preventive practice towards DF and source of information among the respondents.

Table number 10 shows the association between the level of knowledge about DF and source of information. The level of knowledge regarding the Dengue fever is statistically significant with ever heard from health professional (P=0.003).

Table 10. Association between Level of practice against DF and Source of information (n=192).

Variables	Level of Practice			P-value
	Good No. (%)	*Poor* No. (%)	X^2	
Anyone in the family suffered from dengue				
Yes	14 (73.7%)	5 (26.3%)		1.226
No	105 (60.7%)	68 (39.3%)		
Ever heard from health professionals				
Yes	41 (78.8%)	11 (21.2%)	8.610	*0.003**
No	78 (55.7%)	62 (44.3%)		
Heard dengue from any kinds of media (only yes n=129)				
TV	43 (63.2%)	25 (36.8%)		
Radio	23 (74.2%)	8 (23.3%)		
Internet	23 (76.7%)	7 (23.3%)		
Heard from friends or neighbour				
Yes	91 (59.9%)	61 (40.1%)	1.379	0.240
No	28 (70%)	12 (30%)		

*Significant level at 0.05

7. Conclusion

Based on the finding of descriptive analysis, it is concluded that 41.7% had poor knowledge and 38% had poor preventive practice among the community people Regarding socio-demographic characteristics, this study concluded that out of 192 respondents, female majority was found 57.8% which is similar to another study conducted by Vinoth et al. (2016) where 54.5% female were found [20]. In this study the major religion followed by the respondent was Hindu among all other religion comprising 76.6% which is similar to the study conducted by the Meghanath et al. (2014) where the major religion was found to be 70% [6]. Major occupation was Agriculture comprising 54.7% which was similar in the study conducted in another study in Jhapa [21]. In this study the marital status among the total respondent were married which comprises maximum percentage 82.8%, 14.1% respondent were unmarried which was similar in the percentage of another study which consist of 87.8% married and 11.5% unmarried [22]. In this study 59.9% had joint family and 40.1% Nuclear family type but in the similar study there were 67.4% Nuclear and 32.6% joint family type [20]. There were 46.9% respondent who had completed secondary and above, 30.2% primary and below primary and 22.9% respondent were illiterate and similar study conducted Yemen concluded there were 18% illiterate which is similar to this study [14], similarly secondary educational level was 43% and 33% were higher educational status [6] which is similar to this study comprising more educated respondent. 35.4% heard from TV, Radio 16.1% as a source of information, similar finding was seen in the other study which found that 65.5% heard from TV/Radio [19]. 41.9% had poor knowledge and 58.3% had good knowledge whereas there were 85.3% medium and 14.7% high knowledge in another study [21].

62% had good preventive practice and 38% had poor preventive practice regarding the dengue fever likewise 54.1% poor preventive practice was seen in another study conducted in Jhapa [21]. Use of Mosquito bed-net, use of fan were most practiced for the prevention of dengue fever which was found similar in other study [14, 23]. knowledge was found to be associated with the Age (P<0.001) alike to the study conducted by Bhumika et al. (2012) which stated that knowledge of the dengue was significantly associated with the age (P=0.005) [24] also similar association was found in the study carried out in Jhapa [21]. This finding was in contrast to the study conducted by the Megha Dhimal et al (2014), which illustrate that there was no association between Knowledge and age [6]. Knowledge was also found to be associated with the educational status with P=0.001 which was similar to the study conducted in the Delhi 2017 where the knowledge was associated with the educational level (P=0.011). The level of knowledge was not found to be associated with the marital status, which was similar to the study conducted in the Eastern Nepal [19]. The level of knowledge was significantly associated with the size of the family (P=0.040). The level of the knowledge was found to be associated with the Types of Family (P=0.007) alike to the study conducted in the Tamil Nadu 2017, where the significance association was seen between knowledge and Types of family (P=0.043). The inferential analysis shows that there is significant association between the level of knowledge with age, types of family, size of family, educational level and family suffered from dengue and the level of preventive practice was associated with the ever heard from health professional.

References

[1] Kumar Shah S, Karki K. Knowledge and preventive practices on dengue among slum dwellers of middle adulthood in Jhapa district of Nepal. MOJ Public Heal [Internet]. 2019; 8 (4): 143–7. Available from: http://medcraveonline.com.

[2] Department of Health Services. Department of health services Nepal annual report 2074/75 (2017/18). 2018; 75. Available from: https://phpnepal.org.np/publication/currentissue/recently-released/238-annual-report-of-department-of-health-services-2074-752017-2018.

[3] World Health Organization. Dengue and severe dengue. WHO Fact Sheet [Internet]. 2014; 117 (March): 1–4. Available from: www.who.int/mediacentre/factsheets/fs117/en/index.html.

[4] EDCD (Epidemiology and Disease Control Division). National Guidelines on Prevention, Management and Control of Dengue in Nepal. 2019; 1–90. Available from: https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue.

[5] CDC. Dengue and the Aedes aegypti mosquito. Aegypti Fact Sheet. 2012; 2.

[6] Dhimal M, Aryal KK, Dhimal ML, Gautam I, Singh SP, Bhusal CL, et al. Knowledge, attitude and practice regarding dengue fever among the healthy population of highland and lowland communities in Central Nepal. PLoS One. 2014; 9 (7).

[7] Khetan RP, Stein DA, Chaudhary SK, Rauniyar R, Upadhyay BP, Gupta UP, et al. Profile of the 2016 dengue outbreak in Nepal. BMC Res Notes [Internet]. 2018; 11 (1): 1–6. Available from: https://doi.org/10.1186/s13104-018-3514-3.

[8] Prevention E center for diseases control and. Dengue worldwide J [Internet]. Available from: https://www.ecdc.europa.eu/en/dengue-monthly.

[9] Ministry of Health and Population DHS EDCD Victor Borne Disease Updates http://edcd.gov.np/news/download/dengue-updates1.

[10] Service u. department of health and human. Symptoms and Treatment _ Dengue _ CDC [Internet]. U.S department of health and human service; Available from: https://www.cdc.gov/dengue/symptoms/index.html.

[11] Nayyar U, Dar UF, Latif MZ, Haider R, Mahmud T, Nizami R. Knowledge, awareness and practices about dengue fever among university students. Pakistan J Med Heal Sci. 2013; 7 (4): 1097–100.

[12] Horstick O, Tozan Y, Wilder-Smith A. Reviewing Dengue: Still a Neglected Tropical Disease? PLoS Negl Trop Dis. 2015; 9 (4): 1–18.

[13] Acharya BK, Cao C, Xu M, Khanal L, Naeem S, Pandit S. Present and future of dengue fever in nepal: Mapping climatic suitability by ecological niche model. Int J Environ Res Public Health. 2018; 15 (2).

[14] Alyousefi TAA, Abdul-Ghani R, Mahdy MAK, Al-Eryani SMA, Al-Mekhlafi AM, Raja YA, et al. A household-based survey of knowledge, attitudes and practices towards dengue fever among local urban communities in Taiz Governorate, Yemen. BMC Infect Dis [Internet]. 2016; 16 (1): 1–9. Available from: http://dx.doi.org/10.1186/s12879-016-1895-2.

[15] C. Yboa B, J. Labrague L. Dengue Knowledge and Preventive Practices among Rural Residents in Samar Province, Philippines. Am J Public Heal Res. 2013; 1 (2): 47–52.

[16] Hossain M, Akter S, Suriea U, Akter S, Shifat SK, Islam M, et al. Knowledge, awareness and preventive practices of dengue outbreak in Bangladesh: a countrywide study. 2020; 1–22.

[17] Nurunnabi M, Rahman T, Hasan F, Fr K. Community Knowledge, Awareness and Practices on Dengue Fever among the Rural Residents Community Knowledge, Awareness and Practices on Dengue Fever among the Rural Residents. 2020; (August).

[18] Said MFF, Abdullah H, Abdul Ghafar N. Dengue prevention practices among community in dengue hotspot area. Vol. 5, International Journal of Community Medicine and Public Health. 2018. p. 4664.

[19] KC H, Parajuli SB. Dengue Awareness and Practice Among the People Living in Haraincha Village Development Committee of Eastern Nepal. Birat J Heal Sci. 2017; 1 (1): 38–46.

[20] Chellaiyan VG, Manoharan A, Ramachandran M. Knowledge and awareness towards dengue infection and its prevention: a cross sectional study from rural area of Tamil Nadu, India. Int J Community Med Public Heal. 2017; 4 (2): 494.

[21] Subedi S, Shah SK, Karki K, Karki R, Dev R, Gautam KR. Knowledge and preventive practices on dengue among slum dwellers of middle adulthood in Jhapa district of Nepal. 2019; (July).

[22] The KAP Study on Dengue among Community in Taman Salak Baiduri. 2017; 2 (September): 19–25.

[23] Chakkanmattil S, Zachariah SM, Soman DK, J. J. J, K. P. A, Naina MJ. Knowledge and preventive practices regarding dengue in an urban area of Palakkad. Int J Community Med Public Heal. 2019; 7 (1): 105.

[24] Sharma B, Regmi S, Aryal B, Neupane MS. Knowledge and Attitude of Dengue Fever among Clients from Dengue Prevalent Areas. 2012; (July 2020).