

Awareness regarding Dengue among Adults of Pokhara-30, KaskiPratigya Bhandari¹, Shobha Parajuli¹

School of Health and Allied Sciences, Faculty of Health Sciences, Pokhara University, Kaski, Nepal

ABSTRACT

Introduction: Dengue is a mosquito borne viral infection that is a major public health concern in recent decades. Nearly 400 million people are infected each year, about 5% develop the fatal dengue hemorrhagic fever and dengue shock syndrome and almost 20,000 patients annually. Rapid urbanization, environmental changes and neglected areas (rural and slums) result in vector breeding causing rise in dengue outbreaks. The objective of the study was to assess the awareness regarding dengue among adults of Pokhara.

Methods: A cross-sectional study was conducted among 162 adults of age 21 to 59 years residing in Pokhara-30, Kaski with purposive sampling technique. Data were collected using semi-structured interview schedule. The data were entered in to MS Excel and analyzed by using SPSS version 25. A Chi-square test was used to find the association between variables and level of awareness (good $\geq 80\%$, satisfactory 60-79%, and poor $< 60\%$) on dengue.

Results: The study found that the mean knowledge score of the respondents was 25.85 ± 5.48 . Among adults, 13.6 percent had good level of awareness, 50.6 percent had satisfactory and 35.8 percent had poor level of awareness on dengue. The level of awareness on dengue was significantly associated with respondent's educational status ($p = 0.017$), presence of family member in health-related field ($p = 0.021$), source of information i.e. mass media ($p = 0.017$) and health personnel ($p = 0.023$) and exposure to awareness program on dengue ($p = 0.002$).

Conclusion: The findings of the study concluded that only few of the respondents had good level of awareness regarding dengue. This indicates an urgent need for planning and implementing the extensive dengue awareness programs to the community people through mass media and their active participation.

Keywords: *Adults, Awareness, Dengue***INTRODUCTION**

Dengue is a mosquito borne viral infection caused by dengue virus (DENV) of family Flaviviridae. There are four distinct, but closely related serotypes of the virus that causes dengue i.e. DENV-1, DENV-2, DENV-3, DENV-4.¹ Dengue is transmitted by bites of *Aedes aegypti* and to a lesser extent *Aedes albopictus* mosquito.² It is found in most tropical and subtropical areas of the world.³ According to the recent study, 390 million of dengue virus infections are estimated to occur per year; over -tropical regions. DENV is frequently transported from one place to another by infected travelers; when susceptible vectors are present in these new areas, there is the potential for local transmission to be established.¹ Dengue virus infection has globally become a major public health concern since the incidence of dengue fever has increased more than 30-fold over the last five decades and the disease is now endemic in 128 countries, three times more than the previous estimated by the World Health Organization (WHO) suggested.⁴ Globally, nearly 400 million people

are infected each year by dengue.⁵ Dengue predominantly occurs in Southeast Asia, the Americas, Africa and the Caribbean Islands.⁶ Dengue is widespread throughout the tropics, with local variations in risk influenced by rainfall, temperature, relative humidity and unplanned rapid urbanization.⁷

In Nepal, the first case of dengue was reported in a Japanese volunteer in 2004. Since then, it has been rapidly spreading in almost all areas of Nepal and many outbreaks are recorded. In addition, clinical and laboratory test results confirmed the circulation of all four DENV serotypes during the 2006 outbreak in Nepal. The 32 confirmed cases of the 2006 outbreak were followed by 27 confirmed cases in 2007, 10 in 2008, 30 in 2009, and 917 including five deaths in 2010.⁴ The number of reported dengue cases had decreased significantly since

Correspondence: Shobha Parajuli, School of Health and Allied Sciences, Pokhara University, Pokhara, E-mail: shobhaparajuli039@gmail.com

2010 but cases of dengue were increased in recent years.⁸ In FY 2074/2075, total 2111 cases were reported from 28 districts. The majority of cases have been reported from Rupandehi(32%), Jhapa(25%), Mahottari(20%) and Sarlahi(6%).⁹ During the F/Y 2076/2077, 10,808 cases were reported from 55 districts. The majority of the cases have been reported from Chitwan (2,612), Kaski (2,221), Rupandehi (1,386) and Kathmandu (1,220). As well there were three confirmed deaths due to. Dengue-each from Chitwan, Jhapa and Arghakhanchi.¹⁰ Dengue causes a wide spectrum of diseases that can range from subclinical disease to severe flu like symptoms. Occasionally, this develops into a potentially lethal complication, called severe dengue. It is associated with severe bleeding, organ impairment and or plasma leakage which has higher risk of death when not appropriately managed.¹⁰ There is no specific treatment for dengue/severe dengue and access to proper medical care lowers fatality rates of severe dengue below 1%.¹ Dengue's prevention and control depends on effective vector control measures through sustained community involvement particularly during out breaks.¹¹ Though the people know some basic ideas about the disease, they actually don't know about the complications and are taking it lightly.¹² Urbanization (especially unplanned) is associated with dengue transmission through multiple social and environmental factors like population density, human mobility, access to reliable source of water, water storage practice etc. The risks of dengue among community people also depends on their knowledge, attitude and practice towards dengue, as well as the implementation of routine sustainable vector control activities in the community.¹ There is significant increase in cases of dengue in recent years affecting mostly younger age group where the adult population are more prone to have severe dengue and it's complications.¹ As the adults are the people who are more responsible for the prevention of dengue among themselves and their children, it is necessary to find out the awareness level on dengue so that awareness raising programs can be planned and conducted as needed. Therefore, the researcher is interested to conduct the study to assess the awareness on dengue among the adults.

METHODS

A community based cross-sectional study was conducted among the 162 adults of age 21 to 59 years residing in ward no. 30 of Pokhara Metropolitan City,

Kaski, excluding health workers. The sample size was calculated by taking the prevalence as 12%.⁴ Purposive sampling technique was used to select the sample. Data was collected from 21st of April to 4th May, 2021. Assuming the ward office as a center point, a pencil was spinned and followed the pointed direction as starting point for data collection. Data was collected from the consecutive houses until the desired number of sample were obtained. If more than one study population were present in the same family, only one member was selected as a sample by lottery method. The semi-structured interview schedule was used for data collection. Validity of the instrument was maintained by incorporating expert's opinion and extensive literature review. The reliability was maintained by pretesting of instrument among 10% of the sample size in similar setting i.e. ward no. 29, which was excluded from the study and minor modifications on tool were made as well. Reliability of the instrument was calculated by using Karl Pearson's correlation coefficient test where reliability was found to be 0.76 which indicated that the instrument was reliable. The data were primarily collected by the researcher after obtaining informed written consent by interview. Proper health precautions as well as social distancing were maintained from the respondents at the time of data collection as a preventive measure of COVID-19. Privacy and confidentiality was maintained throughout the study. Any queries related to dengue were clarified after the collection of data. The collected data were coded and entered in to MS Excel and exported to SPSS version 25 for further analysis. Descriptive as well as inferential statistics were used. The level of significance was considered at 5% with p-value <0.05 and 95% confidence interval.

RESULTS

Table 1: Socio-demographic Information of the Respondents (n=162)

Variables	Frequency	Percentage (%)
Age		
(Mean age=37.38±11.37)		
21-39 years	90	55.6
40-59 years	72	44.4
Sex		
Female	84	51.9
Male	78	48.1
Religion		
Hindu	129	79.6
Buddhist	23	14.2
Christian	10	6.2

Ethnicity		
Upper caste group	93	57.4
Janajati	48	29.6
Dalit	21	13.0
Type of family		
Nuclear	83	51.2
Joint	79	48.8

Table 1 shows that 55.6 percent of the respondents were belong to young adulthood, more than half were female (51.9%) and most of them (79.6%) followed Hinduism. Among the respondents, 57.4 percent were from upper caste group and 51.2 percent were residing in nuclear family.

Table 2: Socio-economic and Other related Information of the Respondents (n=162)

Variables	Frequency	Percentage (%)
Educational status		
Illiterate	2	1.2
Non formal education	47	29.0
Basic level	29	17.9
Secondary level	45	27.8
Bachelor and above	39	24.1
Occupation		
Agriculture	36	22.2
Business	29	17.9
Home maker	28	17.3
Student	26	16.0
Service	22	13.6
Others	20	12.9
Family members working in health related field		
	41	25.3
Source of information used		
Mass media	90	55.6
Social media/Internet	80	49.4
Family/Friends/Relatives	80	49.4
Health Personnel	28	17.3
Awareness Program	42	25.9
Family history of dengue		
Exposure to awareness program on dengue	36	22.2

Table 2 reveals that, regarding the educational status of the respondents, 29% had non-formal education, 27.8% had secondary level and 24.1% had higher level education. Among them, 22.2% were engaged in agriculture, 25.3% had their family members working in health related field, 3.7% had family history of dengue and only 22.2 percent had exposure to awareness programs on dengue. Majority of them (55.6%) had received information on dengue through mass media.

Table 3 : Awareness regarding Dengue among Respondents (n=162)

Items (Correct Responses)	Frequency	Percentage (%)
Meaning:		
Infection transmitted by infected mosquitoes.	152	93.8
Microorganism causing dengue:		
Virus	93	57.4
Virus causing dengue:		
Dengue virus	146	90.1
Vector transmitting the virus:		
Mosquito	151	93.2
Mosquito that causes dengue:		
Aedes aegypti and aedes albopictus	90	55.6
Mode of transmission:		
Mosquito bite.	149	92.0
Age group at risk:		
Children	105	64.8
Prognosis:		
Bad	86	53.1
Incubation period:		
4-10 days	92	56.8
Common breeding site of dengue mosquito:		
Water containers such as boxes, cans, pots, tires, etc.	117	72.2
Timing of dengue mosquito bite:		
day time	104	64.2

Table 3 presents that almost all of the respondents (93.8%) were aware regarding the meaning of dengue. Only 57.4% replied dengue is a viral disease but 90.1% said dengue is caused by dengue virus. Among the respondents, 93.2% replied mosquito is the vector that transmits dengue, 92.0% were aware about mode of transmission, 64.8% recognized children as a risk group and only 53.1% viewed

dengue has bad prognosis. Just more than half (56.8%) were aware about the incubation period, 72.2% had the knowledge that dengue mosquito breeds commonly in water holding containers and 64.2% were aware that dengue mosquito bites during the day time.

Table 3.b: Awareness regarding Dengue among Respondents (n=162)

Items	Frequency	Percentage (%)
Common Signs and Symptoms*		
High fever	125	77.2
Pain in the back of eyes	99	61.1
Painful joints and muscles	85	52.5
Rashes	44	27.2
Diarrhoea	18	11.1
Cough	10	6.2
Features that need Immediate Attention*		
Seizures	129	79.6
Cold, clammy skin	108	66.7
Rapid breathing	91	56.2
Severe abdominal pain	68	42.0
Bleeding from nose and gums	64	39.5
Complications*		
Death	113	69.8
Paralysis	101	62.3
Respiratory distress	96	59.3
Organ impairment	75	46.3
Severe bleeding	56	34.6

*multiple response

Table 3.b. reveals the awareness regarding features of dengue and severe dengue along with its possible complications among respondents. Majority (77.2%) were aware that fever as a common symptom of dengue followed by pain in the back side of eyes (61.1%), joint and muscle pain (52.5%) and rashes (27.2%). The respondents viewed seizures (79.6%), cold, clammy skin (66.7%) and rapid breathing as the common features of severe dengue that needs immediate medical attention. About 70% of the respondents consider death as a major complication of dengue followed by paralysis (62.3%) and respiratory distress (59.3%).

Table 3.c: Awareness Regarding Dengue among Respondents (n=162)

Items	Frequency	Percentage (%)
Mosquito breeding c ontrol measures*		
Disposing water holding containers	133	82.1
Tightly covering the water containers	126	77.8
Removal of standing water	112	69.1
Covering the pits on the roads	112	69.1
Spraying anti mosquito insecticides	106	65.4
Using mosquito repellent	25	15.4
Preventive measures from mosquito bite*		
Use mosquito coils	74	45.7
Making smoke in the house	9	5.6
Use of window screens and bed net	134	82.7
Spray insecticides	92	56.8
Wearing long-sleeved clothes	131	80.9
Who are more responsible to prevent dengue #		
Community people	122	75.3

*multiple response #correct response

Table 3.c. presents that majority of the respondents were aware regarding the measures to control mosquito breeding i.e. disposing the water holding containers (82.1%) followed by tightly covering the water containers (77.8%) and removal of standing water and covering the pits (69.1%). In response to preventive measures of mosquito bite, most of them (82.7% and 80.9% respectively) replied the use of window screens plus bed net and wearing long-sleeved clothes. Majority (75.3%) viewed community people themselves are more responsible for the prevention of dengue.

Table 4: Level of Awareness on Dengue among Respondents (n =162)

Level of Awareness	Frequency	Percentage(%)
Mean score \pm S.D. =25.85 \pm 5.48		
Good	22	13.6
Satisfactory	82	50.6
Poor	58	35.8

The level of awareness is categorized as good ($\geq 80\%$), satisfactory (60-79%), and poor ($< 60\%$).⁴ Table 4 illustrates that only 13.6 percent of the respondents had good level of awareness on dengue where as 50.6% had exhibited satisfactory level and rest of them had poor level of awareness on dengue.

Table 5: Association of Level of Awareness on Dengue with selected Variables of the Respondents n=162

Variables	Level of Awareness			Chi-square value	p-value
	Good	Satisfactory	Poor		
Age					
21-39 years	16(17.8%)	48(53.3%)	26(28.9%)	5.626	0.06
40-59 years	6(8.3%)	34(47.2%)	32(44.4%)		
Sex					
Female	14(16.7%)	39(46.4%)	31(36.9%)	1.888	0.389
Male	8(10.3%)	43(55.1%)	27(34.6%)		
Ethnicity					
Upper caste group	14(63.6%)	45(54.9%)	34(58.6%)	0.599	0.741
Janajati and Dalit	8(36.4%)	37(45.1%)	24(41.4%)		
Educational status					
Illiterate and					
Informal education	6(24.1%)	22(26.8%)	21(36.2%)	8.144	0.017*
Formal education	21(95.5%)	55(67.1%)	37(63.8%)		
Occupation					
Employed	11(50.0%)	37(45.1%)	16(27.6%)	5.544	0.063
Unemployed	11(50.0%)	45(54.9%)	42(72.4%)		
Family members working in health related field					
Yes	10(24.4%)	22(53.7%)	9(22.0%)	7.765	0.021*
No	12(9.9%)	60(49.6%)	49(40.5%)		
Source of Information					
Mass media					
No	5(6.9%)	34(47.2%)	33(45.8%)	8.140	0.017*
Yes	17(18.9%)	48(53.3%)	25(27.8%)		
Friends/Family/Relatives					
No	10(12.2%)	39(47.6%)	33(40.2%)	1.456	0.483
Yes	12(15%)	43(53.8%)	25(31.3%)		
Health personnel					
No	14(10.4%)	68(50.7%)	52(38.8%)	7.558	0.023*
Yes	8(28.6%)	14(50%)	6(21.4%)		
Exposure to awareness programs on Dengue					
Yes	8(22.2%)	22(66.7%)	6(11.1%)	12.783	0.002*
No	14(11.1%)	58(46.0%)	54(42.9%)		

*p-value significant at <0.05

Table 5 represents that there was statistically significant association of level of awareness on dengue with educational status ($p = 0.017$), family members working in health related field ($p = 0.021$), respondent's source of information i.e. mass media ($p = 0.017$) and health personnel ($p = 0.023$) and exposure to awareness programs on dengue ($p = 0.002$).

DISCUSSION

This study revealed that almost all of the respondents (93.8%) were familiar with the meaning of dengue. This is similar to the findings of the study from Karachi, Pakistan.¹³ where 92.3 percent of

the respondents were familiar with the meaning of dengue. Similar study conducted on Pakse, Laos.¹⁴ also showed that 91.9 percent of the respondents were familiar with the meaning of dengue.

In this study, majority of the respondents (72.2%) were aware that dengue mosquito breeds commonly in water holding containers. The finding is supported by the similar study conducted on Pakse, Laos.¹⁵ The contradictory findings were reported in a study conducted in Puducherry, South India.¹⁵ where 67.8 percent of the respondents answered drains and garbage as the most common breeding site of mosquito, and only 25.1 percent were aware that dengue mosquito

breeds in clean water-holding containers.

Regarding the signs and symptoms of dengue, majority of the respondents (77.2%) were aware that fever as a common symptom of dengue. Fever and headache were also the most frequently stated symptoms in similar studies conducted in central Nepal,⁴ Jamaica,⁶ Laos,¹⁴ South India,¹⁵ and Pakistan.¹⁶ Low percent of the respondents (6.2%) in this study were able to correctly identify rashes as common symptoms of dengue which is consistent with findings of the study conducted on North India¹¹ where only 11 percent of the respondents were aware about rashes as a symptom of dengue. This might be due to neither the personal experience of the disease nor witnessed a case from a close relative or friend.

Regarding the level of awareness on dengue, 13.6 percent of the respondents had good level of awareness, more than half of the respondents (50.6%) had satisfactory and 35.8 percent had poor level of awareness on dengue. Similar result was found in the study conducted on Central Nepal⁴ where 12 percent of the respondents had good level of knowledge, 42.38 percent had satisfactory and 45.62 percent of them had poor level of knowledge on dengue. The findings is also supported by the study conducted at Chitwan Medical College, Nepal⁵, among the medical and dental students, where only 20.8 percent had good level of knowledge, more than half (69.3%) had satisfactory and 9.9 percent of the students had poor level of knowledge on dengue which signifies the need of awareness raising programme to all sphere of population irrespective to their profession and literacy level.

The finding of this study revealed that the level of awareness on dengue was significantly associated with respondents' educational status ($p=0.017$), presence of family member in health related field ($p=0.021$), source of information i.e. mass media ($p=0.017$) and health personnel ($p=0.023$), and respondents' exposure to awareness program on dengue ($p = 0.002$). The study conducted on Westmoreland, Jamaica⁶ also found the association of level of awareness with educational status of the respondents but the study did not find statistically significant association with such other variables. Similarly, the association of level of awareness with respondent's participation on awareness program was found on the study conducted at Islamabad.¹⁷

Similarly, the association of level of awareness with source of information i.e. mass media and health personnel was observed on the study conducted in North Indian city, Chandigarh, India.⁷

CONCLUSION

The study was conducted to assess the awareness on dengue among the adults. The findings of the study concluded that the awareness on dengue was not good among the community people. So, an emphasis should be provided on health education programme to increase community awareness on prevention of dengue fever.

ACKNOWLEDGMENT

We would like to express our sincere gratitude to Institutional Review Committee (IRC) Pokhara University for providing ethical approval for this study. Similarly, we would like to thank to all those respondents who gave their valuable time and information required for this study.

REFERENCES

1. World Health Organization. Dengue and severe dengue [Internet]. [cited 2020 Jun 30]. Available from: <https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue>
2. Ibrahim NKR, Al-Bar A, Kordey M, Al-Fakeeh A. Knowledge, attitudes, and practices relating to Dengue fever among females in Jeddah high schools. *J Infect Public Health*. 2009;2(1):30–40.
3. Al-Dubai SA, Ganasegeran K, Mohanad Rahman A, Alshagga MA, Saif-Ali R. Factors affecting dengue fever knowledge, attitudes and practices among selected urban, semi-urban and rural communities in Malaysia. *Southeast Asian J Trop Med Public Health*. 2013;44(1):37–49.
4. 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).
5. Jha R, Adhikari K, Shah DK, Samsul A, Dhungana G, Basnet S, et al. Knowledge and Awareness regarding Dengue among the Undergraduate health Science students of Dengue Hit region of Nepal. *Int Res J Med Sci*. 2016 Jan 28;
6. Shuaib F, Todd D, Campbell-Stennett D, Ehiri J, Jolly PE. Knowledge, attitudes and practices regarding dengue infection in Westmoreland, Jamaica. *West Indian Med J*. 2010;59(2):139–46.

7. Malhotra G, Yadav A, Dudeja P. Knowledge, awareness and practices regarding dengue among rural and slum communities in North Indian city, India. *Int J Med Sci Public Health*. 2014;3(3):295–9.
8. Annual Report 2074-75 – Department of Health Services [Internet]. [cited 2020 Jun 30]. Available from: <https://dohs.gov.np/annual-report-2074-75/>
9. Adhikari N, Subedi D. The alarming outbreaks of dengue in Nepal. *Trop Med Health* [Internet]. 2020 Feb 7 [cited 2020 Oct 5];48(1):5. Available from: <https://doi.org/10.1186/s41182-020-0194-1>
10. Annual Report 2076-77- Department of Health Services. Public Health Concern [Internet]. [cited 2021 Aug 26]. Available from: <https://publichealthconcern.com/annual-report-2076-77-2019-20/>
11. Chinnakali P, Gurnani N, Upadhyay RP, Parmar K, Suri TM, Yadav K. High level of awareness but poor practices regarding dengue fever control: Assss cross-sectional study from North India. *North Am J Med Sci* [Internet]. 2012 Jun 1 [cited 2020 Jun 28];4(6):278. Available from: <http://www.najms.org/article.asp?issn=1947-2714;year=2012;volume=4;issue=6;page=278;epage=282;aualast=Chinnakali;type=0>
12. Dengue Around the World | Dengue | CDC [Internet]. 2020 [cited 2020 Jul 2]. Available from: <https://www.cdc.gov/dengue/areaswithrisk/around-the-world.html>
13. Nalongsack S, Yoshida Y, Morita S, Sosouphanh K, Sakamoto J. Knowledge, attitude and practice regarding dengue among people in Pakse, Laos. *Nagoya J Med Sci*. 2009;71(1–2):29–37.
14. Rafique I, Saqib MAN, Munir MA, Qureshi H, Taseer I-U-H, Iqbal R, et al. Asymptomatic dengue infection in adults of major cities of Pakistan. *Asian Pac J Trop Med*. 2017 Oct;10(10):1002–6.
15. Jeelani S, Sabesan S, Subramanian S. Community knowledge, awareness and preventive practices regarding dengue fever in Puducherry–South India. *Public Health*. 2015;129(6):790–6.
16. Ibrahim NKR, Al-Bar A, Kordey M, Al-Fakeeh A. Knowledge, attitudes, and practices relating to Dengue fever among females in Jeddah high schools. *J Infect Public Health*. 2009;2(1):30–40.
17. Javed N, Ghazanfar H, Naseem S. Knowledge of Dengue Among Students Exposed to Various Awareness Campaigns in Model Schools of Islamabad: A Cross-Sectional Study. *Cureus* [Internet]. [cited 2020 Jun 28];10(4). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5991922/>