

# Knowledge and preventive practices on dengue among slum dwellers of middle adulthood in Jhapa district of Nepal

## Abstract

**Introduction:** Dengue is a mosquito-borne tropical disease which is a major health concern across the globe. The year 2016 was characterized by large dengue outbreak worldwide. In Nepal, the first dengue case was reported in 2004 whereas Nepal had experienced a major outbreak of Dengue in several districts in 2010. Since there is no specific vaccine available, awareness to prevent and control is a must.

**Objective:** This study is aimed to assess the knowledge and preventive practices of dengue among slum dwellers of middle adulthood (40–65years) in Jhapa district of Nepal.

**Methodology:** A descriptive cross-sectional study was conducted from March of 2018. Non-probability purposive sampling technique was applied to collect data among 109 households through face to face interview using semi-structured questionnaire for knowledge and checklist for practice assessment. Then data was analyzed in SPSS version-20. Total knowledge and practice score were calculated and association between different variables was measured.

**Result:** 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.

**Conclusion:** 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.

**Keywords:** knowledge, preventive practices, dengue, middle adulthood, awareness

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Suraksha Subedi,<sup>1</sup> Sanjeev Kumar Shah,<sup>2</sup> Kshitij Karki,<sup>1</sup> Rojeena Karki,<sup>1</sup> Ramneek Dev,<sup>2</sup> Koshish Raj Gautam<sup>3</sup>

<sup>1</sup>Asian College for Advance Studies, Purbanchal University, Nepal

<sup>2</sup>National Open College, Pokhara University, Nepal

<sup>3</sup>KS Hegde Medical Academy, Nitte University, India

**Correspondence:** Sanjeev Kumar Shah, National Open College, Pokhara University, Nepal, Tel +977-9851131401, Email just4sanjeev@gmail.com

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## Background

Dengue is an acute infectious disease caused by a flavi virus (species Dengue virus of the genus Flavi virus), transmitted by aedes mosquitoes, and characterized by headache, several joint pains, and a rash – called also break bone fever, dengue fever.<sup>1</sup>

Dengue should be suspected when a high fever (40/104°F) is accompanied by two of the following symptoms; several headache, pain behind the eyes, muscle and joint pains, nausea, vomiting, swollen glands or rash. Symptoms usually last for 2–7days, after an incubation period of 4–10days after the bite from an infected mosquito.<sup>2,3</sup>

There is no vaccine to prevent human infection by this virus. Personnel protection and the environmental management of mosquitoes are important in preventing illness.<sup>4</sup> Prevention is the most important step, and prevention means avoiding mosquito bites. The best way to reduce mosquitoes is to eliminate the place where the mosquito lays its eggs, like artificial containers that hold water in and around the home.<sup>3,5,6</sup> Outdoors, clean water containers like pet and animal watering containers, flower planter dishes or cover water storage barrels. Look for standing water indoors such as in vases with fresh flowers and clean at least once a week. The adult mosquitoes like to sit inside as well as around homes, during the day and at night when the lights are on. To protect self, use repellent on skin while indoors or out. When possible, wear long sleeves and pants for additional

protection. Also, make sure window and door screen are secure and without holes.<sup>2,4,7</sup>

## Global scenario

The year 2016 was characterized by large dengue outbreaks worldwide. The Region of the Americas region reported more than 2.38millioncases in 2016, where Brazil alone contributed slightly less than 1.5millioncases, approximately 3 times higher than in 2014 and 1032 dengue deaths were also reported in the region.<sup>2-4,8</sup> The Western Pacific Region reported more than 3,75,000 suspected cases of dengue in 2016, of which the Philippines reported 1,76,411 and Malaysia 1,00,028cases, representing a similar burden to the previous year for both countries. The Solomon Islands declared an outbreak with more than 7000 suspected. In the African Region, Burkina Faso reported a localized outbreak of dengue with 1061 probablecases.<sup>6,9-11</sup>

## In asian countries

In Pakistan, in the summer of 2011, more than 300 people died of Dengue fever. The prevalence of the disease was over 14,000. The outbreaks occurred mostly in the Lahore area, Punjab, Pakistan. In 2013, in Guangdong, China, there was a 15-fold increase over last year and 5-fold increase of mosquitoes has left the normally lightly hit region stunned. Likewise Taiwan also had a 10-fold increase in cases in 2013.<sup>2,3,6,12</sup>

## In Nepal

According to Medical Superintendent of the district hospital, Dhading, cases of dengue infection have steadily gone up in Dhading since the past two weeks. As of now, 27 cases of dengue have been detected in the district by local clinics and the district hospital. The infection is especially high at the district headquarters and the surrounding areas. Terror has gripped the locals with the rise in cases of dengue.<sup>5</sup>

A total of 134 dengue cases were reported from 26 districts in 2016/17. The most were from Chitwan followed by Nawalparasi and Parsa. And there were 2 confirmed deaths due to Dengue— in Dang and Chitwan. There was one confirmed death in 2015 in Dang. The number of reported dengue cases has decreased significantly since 2010 with 83% decrease in last 3 years from 785 to 302 to 134 in current year. The majority of cases have been reported from Chitwan and Parsa with more than 50% of 2016/17 cases from Chitwan.<sup>5,9,13</sup>

## In Jhapa

As per the details provided by DPHO in 2017, Jhapa, as many as 52 people have been infected with dengue. 100 patients with disease are languishing in various hospitals of district. As per the record of B and C (government hospital record system) hospital of Birtamode, 120 patients were found infected with dengue in the last two months.<sup>5,13,14</sup>

## Materials and methods

Descriptive cross-sectional study design was used to conduct the study. Non-probability purposive sampling technique was used to select the community. The study area comprised of the slum area at Laxmipur of Jhapa district. A total of 109 middle aged adult population (40 to 65 years) dwelling in the community was selected randomly through pen spinning method. The direction shown by tip of the pen at the center of the community was followed for the data collection using random table. Data collection technique was face to face interview and semi-structured interview schedule was used as a tool for collection of the data. The tools were divided into following sections:

- a) Socio-demographic data
- b) Knowledge regarding dengue fever
- c) Practice of preventive measures of dengue

For validation of this study, Relevant questionnaire was taken from NDHS for developing questionnaire based on study objectives and variables, using related and relevant available standard questionnaire with necessary modification in the local context. For reliability of this study, Data collected with the support from the community health workers. Data was checked for errors and omissions on same day in the field and the consistency of data was maintained.

Ethical approval was taken from institution and the data collection was done after formal administrative approval obtained from the concerned authority and after getting consent from the study participants. Descriptive analysis such as frequency, percentage and cross tabulation was done using SPSS version 20 after coding, entry and cleaning.

## Results

Analysis and interpretation of data was done in accordance with the objectives laid down for the study.

Table 1 illustrates that out of 109 respondents, around one fourth (28.4%) of the respondents were aged between 40–44, More than fifty percent (53.2%) of the respondent were male, around fifty percent (49.5%) of the respondent belong to Sudra, majority (77.1%) of the respondent belong to Hindu, more than fifty percent (53.2%) of the respondent lived in joint family, around fifty percent (48.6%) of the respondent were farmer, 69.7% of the respondent had monthly income 1000 to 10999.

**Table 1** Socio-demographic information (n=109)

Variables	Frequency (f)	Percentage (%)
<b>Age</b>		
40 – 44	31	28.4
45 – 49	19	17.4
50 – 54	16	14.7
55 – 59	22	20.2
60 above	21	19.3
<b>Sex</b>		
Male	58	53.2
Female	51	46.8
<b>Ethnicity</b>		
Brahmin	20	18.3
Chhetri	26	23.9
Baishav	9	8.3
Sudra	54	49.5
<b>Religion</b>		
Hindu	84	77.1
Muslim	3	2.8
Christian	12	11.0
Buddhist	10	9.2
<b>Family type</b>		
Nuclear	51	46.8
Joint	58	53.2
<b>Occupation</b>		
Farmer	53	48.6
Business	9	8.3
Job holder	10	9.2
Others	37	33.9
<b>Monthly income (In NPR)</b>		
1000 to 10999	76	69.7
11000 to 20999	17	15.6
21000 to 30999	14	12.8
above 31000	2	1.8

Table 2 depicts that all most all (95.6%) of the respondents got information from TV/Radio, All the respondents knew mosquito as a vector for dengue fever, more than fifty percent (56%) of the respondent knew dengue is not contagious (right answer), all most all (99.1%) of the respondent responses everyone can be at high risk for dengue fever. Also, least of the respondent (3.7%) provided correct

answer i.e. risk time for mosquito bite is during “day time”. One third (38.2%) of the respondent believed forest/ bushes as breeding site of mosquito. Also, the above table illustrates that the entire respondent knew mosquito bite as the mode of transmission (correct answer). This study also illustrates that 99.1% of the respondent knew fever as a common clinical manifestation, maximum (94.5%) of the responded to the question on persistent vomiting as danger sign of dengue. The above table also illustrates that all the respondent were aware of death as complication of dengue. All the respondent said medicine as treatment of Dengue, All the respondent knew that dengue is preventable (correct answer) where the entire respondent agreed using mosquito net as prevention of dengue. This study also depicts that the entire respondent had awareness about environmental sanitation, using insecticides, fire smoke as protection from mosquito bite.

**Table 2** Knowledge on Dengue (n=109)

<b>Sources of Information*</b>		
TV / Radio	109	95.6
Newspaper	5	4.4
<b>Vector for Dengue</b>		
Mosquito	109	100.0
<b>Is Dengue contagious?</b>		
No	61	56
Yes	48	44
<b>High risk for Dengue*</b>		
Infants	4	3.7
Elderly	4	3.7
Patient with chronic disease	1	.9
Immunocompromised person	4	3.7
Others	108	99.1
<b>Risk time for mosquito bite</b>		
Dawn	34	31.2
Night	71	65.1
Daytime	4	3.7
<b>Breeding site*</b>		
Items that collect rain water	68	31.3
Stagnant fresh water	45	20.7
Ponds and river	21	9.7
Forest / Bushes	83	38.2
<b>Mode of transmission</b>		
Mosquito bite	109	100
<b>Common clinical manifestation*</b>		
Fever	108	99.1
Joint and muscle pain	61	56.0
Skin rash	55	50.5
Nausea and vomiting	98	89.9
Others	1	.9

Table Continued...

<b>Danger sign*</b>		
Severe pain in abdomen	86	78.9
Persistent vomiting	103	94.5
Passage of black stool	6	5.5
Nose and gum bleed	9	8.3
<b>Complication*</b>		
Dengue hemorrhagic fever	7	6.4
Dengue shock syndrome	41	37.6
Loss of consciousness	31	28.4
Death	109	100.0
<b>Treatment*</b>		
Rest	7	6.4
Adequately drinking water	13	11.9
Vaccines	81	74.3
Medicine	109	100.0
Others	1	.9
<b>Is it Preventable?</b>		
Yes	109	100
<b>Prevention*</b>		
Using mosquito net	109	100.0
Using door or windows screen	109	100.0
Using mosquito repellent	109	100.0
Wearing long sleeves	71	65.1
<b>Protection*</b>		
Environmental sanitation	109	100.0
Using insecticides	109	100.0
Fire smoke	109	100.0
Covering storage	67	61.5

\*=Multiple response

Table 3 depicts that all the respondent practiced using bed nets followed by 99.1% of the respondent practiced cleaning garden, almost all (95.4%) of the respondents practiced covering storage, maximum (89.9%) of the respondent practiced using fire smoke, 67.9% of the respondents practiced avoiding stagnant water, almost half (50.5%) of the respondent practiced using fan, less than fifty percent (42.2%) of the respondent practiced using mosquito coil, minority (8.3%) of the respondent practiced using insecticide spray, least (2.8%) of the respondent practiced using screen windows/doors while none of the respondent practiced using mosquito repellent as preventive practices of dengue.

Table 4 represents majority (85.3%) of the respondent had medium knowledge and 14.7% of the respondent had high knowledge regarding Dengue.

**Table 3** Preventive practices related to dengue (n=109)

Indoor/ outdoor practices	Frequency (f)	Percentage (%)
Use of fan	55	50.5%
Mosquito coil	46	42.2%
Bed nets	109	100.0%
Screen windows/ doors	3	2.8%
Clean garden	108	99.1%
Use insecticides spray	9	8.3%
Using fire smoke	98	89.9%
Covering storage	104	95.4%
Avoiding stagnant water	74	67.9%
Using mosquito repellent	0	0

\*Multiple response

**Table 4** Overall knowledge on Dengue (n=109)

Knowledge	Frequency (f)	Percentage (%)
Medium	93	85.3
High	16	14.7

Table 5 depicts that more than fifty percent (54.1%) of the respondent had poor preventive practices; less than fifty percent (41.3%) of the respondent had fair and least (4.6%) of the respondent had good preventive practices.

**Table 5** Overall preventive practice regarding dengue (n=109)

Preventive Practice	Frequency (f)	Percentage (%)
Below average	59	54.1
Average	45	41.3
Above average	5	4.6

### Bi-variate analysis

Depicts the association between knowledge level and preventive practices of Dengue (p value=<0.0001). Represents that there is association between knowledge and age of the respondent (p value=0.004). Result also shows that there is association between preventive practices and age (p value=0.001) of the respondents.

### Discussion

In this study, it was found that all respondents knew about the vector for dengue alike to the study in different setting conducted by Parajulee & Selvaraj,<sup>9</sup> 2013 at the college of medical sciences-teaching hospital among nurses. It was found that 98% knew about the vector. Likewise; this study is similar to the study conducted by V.L et al., 2014 in a mid-Pacific coastal village of Costa Rica where 98% participants knew the vector.<sup>9,11</sup>

In contrary to this study (56%), a household-based survey among local urban communities in Taiz Governorate, Yemen revealed that only 7.0% of respondents agreed the dengue is non-contagious.<sup>8</sup> In this study, it was found that only least (3.7%) of the respondents were aware of the risk of being bitten by mosquito during day time, similar to the study done in Iquito, Peru which illustrated only few (18.6%) knew that dengue vector bites during day time.<sup>12</sup> Also this study

findings were in contrast to the finding of the study conducted in the Samar provinces, Philippines where majority (69.81%) said that it is more likely to bite in afternoon.<sup>12</sup>

A study done in mid-pacific coastal village of Costa Rica where 98% participants knew that dengue is transmitted by a mosquito, which is similar to this study. Also, it was found that one third (38.2%) of the respondent said mosquito can breed in bushes and 31.3% said that mosquito can breed in stagnant water (items that collect rain water) in contrast to the study done in mid-pacific coastal village of Costa Rica where it was found that 98% knew that the mosquito reproduces in stagnant water.<sup>11</sup>

This study also illustrates that all most all (99.1%) of the respondent agreed to fever which is similar to the study where most commonly recognized symptoms were fever (86.6%) according to the study conducted by Paz-Soldan et al.,<sup>12</sup> done in Iquito, Peru. The study also shows that all most all (100%) of the respondent knew about death as the utmost outcome, minority (6.4%) of the respondent responses dengue hemorrhagic fever as complication of Dengue likely to the study conducted at the college of medical sciences-teaching hospital Nepal among nurses only 52% of nurses knew dengue fever as hemorrhagic fever.<sup>9</sup>

In this study it shows that all of the respondent 100% responded that dengue is preventable similar to the study done among university students in Azaad Kashmir where almost 88.5% student said that dengue is preventable where almost all (85.02%) have identified at least one means of prevention.<sup>6</sup> Similar to the study conducted by Gyawali, Bradbury, & Taylor-Robinson,<sup>15</sup> 2016 in the northeast of Australia, 85.03% correctly identified at least one means of prevention.

In this study 100% practice using bed nets similar to the study conducted among selected adult population in southern Nepal which comprised of Rapti Zonal Hospital, Dang and Bharatpur Zonal Hospital, Chitwan. It was found that garbage disposal, use of mosquito nets and covering water containers were the best known preventive measures<sup>16</sup> Whereas least (2.8%) of the respondent practiced using screen windows/doors as preventive practices of Dengue in contrary to the study done among the healthy population of highland and lowland communities in the five district of CDR of Nepal where 81% used window screen to keep mosquito out of the house. This study also reveals that only 4% of the respondent reported good preventive practices of Dengue. This finding was higher than the study conducted by Dhimal et al.,<sup>10</sup> 2014 among the healthy population of highland and lowland communities in the five district of CDR of Nepal where less than half (37%) of the respondent reported good practice of vector control and prevention.<sup>2,10,16</sup>

### Association between knowledge and age of the respondent

In this study it was found that there was association between knowledge and age of the respondent alike to the study conducted by Abbasi,<sup>6</sup> 2017 which states that knowledge of dengue significantly differed by age (P<0.05).<sup>14</sup> This finding was in contrast to the study conducted by Parajulee & Selvaraj,<sup>9</sup> 2013 which illustrated that there was no association between the respondents knowledge scores with age (p=0.14).

### Association between knowledge and sex of the respondent

In this study it was found that there was no association between knowledge and sex of the respondent (p=0.792) in contrary with the

study conducted by where it was found that knowledge of dengue significantly differed by sex ( $P < 0.05$ ).<sup>6</sup>

### Association between knowledge and practice

In this study among 109 respondents it was found that there was significant association between the knowledge and preventive practices ( $p = 0.00$ ) which is similar with the study conducted by Dhimal et al.,<sup>10</sup> 2014 in the five district of CDR of Nepal in which significantly positive association among the level of knowledge and practice of prevention of vector ( $p < 0.001$ ) was found.<sup>2,9</sup>

However, this study was in contrary with the study conducted by Yboa and Labrague,<sup>7</sup> 2013 where there was no correlation between knowledge about dengue and preventive practices ( $p = 0.75$ ).

### Conclusion

Dengue is a mosquito-borne tropical disease caused by dengue virus which has become a major public health concern. From the study we can conclude that majority of the respondents had medium knowledge regarding dengue and only few of the respondents had high knowledge. Despite of the medium knowledge level, the overall preventive practices of dengue was below average. There was significant association between socio-demographic variables and knowledge level and preventive practices. Also there was significant association between knowledge level and preventive practices of dengue which indicates that upgrading existing knowledge may ultimately lead to changes in the preventive practices. So there is a great need of awareness program regarding dengue and its preventive practices. The health education and awareness effort should be focused to enforcing factor such as house maker regarding knowledge and preventive practices on dengue.

### Limitation

This study has limitation of being representative of only selected area of Jhapa district area and hence cannot be generalized for the entire population.

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### Conflict of Interest

None

### Ethical approval

The study was approved by the Department of Research and Development, Asian College for Advance Studies, Purbanchal University, Nepal. Written permission was obtained from the appropriate authorities and written consent was obtained from study participants.

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