

KNOWLEDGE AND PRACTICES ON DENGUE PREVENTION AMONG THE PEOPLE OF BUDDHABHUMI MUNICIPALITY OF NEPAL: A CROSS-SECTIONAL STUDY

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ABSTRACT

Dengue infection is transmitted to humans through the bite of infected *Aedes* mosquitoes and about half of the world's population now in risk of the dengue infection. The objective of the study was to assess the level of knowledge and practices on dengue prevention among the people of Buddhabhumi Municipality of Kapilvastu district of Nepal. A Cross-sectional study was done among randomly selected 181 households. Head of the households were the respondents for face to face interview. Pretested and validated tool was used for data collection. Statistical Package for Social Sciences version 20 used for data analysis. Percentages, frequency, mean the calculated and Chi-square test applied to measure level of association. Overall knowledge about dengue was good among 30.9% and overall 38.1% of the respondents had good dengue prevention practices. Caste/ethnicity and family type of the respondents are the factors associated with overall knowledge on dengue. Caste/ethnicity and educational status of respondents are associated with dengue prevention practices. For success of dengue prevention, programs should be designed to increase level of knowledge and also the translation of knowledge domain into real preventive measures.

KEYWORDS

Dengue, knowledge, practices, prevention

Received on: June 26, 2022

Accepted for publication: November 11, 2022

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DOI: <https://doi.org/10.3126/nmcj.v25i1.53375>

INTRODUCTION

Dengue fever is transmitted through the bite of an infected *Aedes* species mosquito from one person to another. Almost half of the world's populations live in areas with a risk of dengue¹ and it is a rapidly emerging disease in tropical and subtropical regions.² Dengue causes a wide spectrum of symptoms that might range from subclinical phase to severe flu-like symptoms among infected person. About one in four people infected with dengue will get sick and people who get sick with dengue, symptoms can be mild or severe.³ Majority of the Nepalese population resides in tropical and subtropical regions, more than 50 percent of people in Nepal are in the risk of dengue infection. In Nepal, dengue incidence has increased in recent years largely due to expansion of the vector *Aedes aegypti* and *Aedes albopictus*, as well as the movement of people and imported cases.⁴ Dengue fever, an endemic arboviral disease is one of the major public health concerns in Nepal.⁵ So, this cross-sectional study was conducted to assess the level of knowledge and practices on dengue prevention among the people of Buddhahumi Municipality of Kapilvastu District of Nepal.

MATERIALS AND METHODS

A cross-sectional household survey design has been adopted for this study. All households of Buddhahumi Municipality were the study population. A list of households of Buddhahumi Municipality was obtained from Buddhahumi Municipality and head of the household were the respondents. Head of households of Buddhahumi Municipality, willing to participate and present on the study schedule were included in the study. Sample size was

derived by using the formula: $n = n_0 / \{1 + (n_0 - 1) / N\}$ (where, $n_0 = Z^2 * p * q / e^2 = 1.96^2 * 0.1538^5 * 0.8462 / 0.05^2 = 200$). Thus, $n = 200 / \{1 + (200 - 1) / 1974\} = 181.8$. So, a total of 181 households was the sample size for this study. Simple random sampling technique was used to select 181 households from study population for data collection. A set of data collection tool was developed in English and translated in Nepali language, tools were pretested and finalized. Data collection tool has 37 questions within 3 sections namely; socio-demographic, knowledge and practices. Face to face interview was done with respondents. The purpose of the study was explained to the respondents before data collection; verbal informed consent was obtained from the respondents and ethical approval from IRC-CIST (Ref. No: IRC/118/078/079). The collected data were reviewed and checked for completeness. To assure anonymity, code numbers given on completed questionnaires after they return to the investigator. Data were analyzed using SPSS version 20. For this study, score ≥ 10 were considered as having good knowledge and score ≥ 10 were considered as having good practices on dengue prevention. The results were summarized and presented by tables. Percentages, frequency, mean the calculated and Chi-square test are applied to measure level of association.

RESULTS

Socio-demographic characteristics of respondents: Out of 181 respondents, two third of the respondents (66.3%) were ≤ 40 years of age and 54.1 percent of them were females. Six out of ten (60.2%) were *Brahmin/Chhetri* and large majority (86.2%) of the respondents were literate (Table 1).

Table 1: Socio-demographic distribution of respondents (N=181)

Variables	Category	n	%
Age	≤ 40 years	120	66.3
	> 40 years	61	33.7
Mean age= 38.2 years, SD = 14.46, Minimum = 19 years and Maximum = 72 years			
Sex	Male	83	45.9
	Female	98	54.1
Caste/Ethnicity	<i>Brahmin/Chhetri</i>	109	60.2
	<i>Janjati/Madhese/Dalit</i>	72	39.8
Educational status	Literate (Can read and write Nepali)	156	86.2
	Illiterate (Can't read and write Nepali)	25	13.8
Family type	Nuclear	93	51.4
	Joint	88	48.6

Table 2: Knowledge distribution about dengue among respondents

Variables related to knowledge	Correct knowledge		
	n	%	
Dengue is a communicable disease (n=181)	179	98.9	
Dengue is transmitted by mosquito bite (n = 179)	177	98.9	
Aedes mosquito is the vectors for transmitting dengue (n = 102)	22	21.6	
Correct identification of dengue transmitting mosquito by physical appearance (n=102)	77	75.5	
Aedes mosquito prefers to breed in clean stagnant water (n = 180)	96	53.3	
Time of dengue transmitting mosquito bite (n=181)	98	54.1	
You and your family members are at risk of dengue (n = 181)	149	82.3	
Dengue can be prevented (n = 181)	169	93.4	
Possibility of being infected more than once (n=181)	69	38.1	
Sign of dengue*	Fever	146	80.7
	Headache	107	59.1
	Joint pain	31	17.1
	Muscle pain	19	10.5
	Pain behind eyes	8	4.4
	Nausea/Vomiting	39	21.5
	Others	22	12.2
	Do not know	30	16.6

*multiple responses

Knowledge about dengue: Only 21.6% of the respondent had correct knowledge about the vectors (*Aedes mosquito*) for transmitting dengue. Majority of the respondents stated fever (80.7%) and headache (59.1%) as the major signs of dengue. However, 16.6% of the respondents were not known to any signs of dengue (Table 2). Overall knowledge about dengue was good (score ≥ 10) among 30.9 percent and more than two-third (69.1%) of them has overall poor knowledge about dengue (Table 3).

Dengue prevention practices: Use of bed nets (98.3%) was most common practice to prevent dengue followed by clearing stagnant water around home (93.9%), clearing bushes around

Table 4: Dengue prevention practices among respondents

Variables related to prevention	n	%
Use of mosquito repellent/ coils	81	44.8
Use of bed nets	178	98.3
Windows/doors screening	112	61.9
Clearing bushes around home	165	91.2
Wearing full sleeve clothes	128	70.7
Covering water containers	157	86.7
Clearing stagnant water around home	170	93.9
Creating smoke to drive away mosquitoes	99	54.7
Use of insecticides	7	3.9
Cleaning garbage/trash around home	180	99.4

Table 3: Overall knowledge about dengue among respondents

Category of knowledge*	n	%
Good	56	30.9
Poor	125	69.1
Total	181	100.0

*Score ≥ 10 were considered as having good knowledge

Table 5: Overall dengue prevention practices among respondents

Category of practice*	n	%
Good	69	38.1
Poor	112	61.9
Total	181	100

*Score ≥ 10 were considered as having good practice

home (91.2%), covering water containers (86.7%), wearing full sleeve clothes (70.7%), windows/doors screening (61.9%) and creating smoke to drive away mosquitoes (54.7%). Only 44.8% of the respondents used mosquito repellent/coils for dengue prevention (Table 4). Overall dengue prevention practices were poor (61.9%) among majority of the respondents and only 38.1 percent has good (score ≥ 10) dengue prevention practices (Table 5).

Table 6: Association between socio-demographic factors and knowledge about dengue

Variables	Category	Knowledge about dengue		Chi-square	P-value
		Poor (%)	Good (%)		
Age	≤ 40 years	83 (69.2)	37 (30.8)	0.002	0.966
	> 40 years	42 (68.9)	19 (31.1)		
Sex	Male	57 (68.7)	26 (31.3)	0.011	0.918
	Female	68 (69.4)	30 (30.6)		
Caste/Ethnicity	<i>Brahmin/Chhetri</i>	65 (59.6)	44 (40.4)	11.398	0.001*
	<i>Madhesi/Janjati/Dalit</i>	60 (83.3)	12 (16.7)		
Educational status	Literate (Can read & write Nepali)	104 (66.7)	52 (33.3)	3.03	0.082
	Illiterate (Can't read & write Nepali)	21 (84.0)	4 (16.0)		
Family type	Nuclear	57 (61.3)	36 (38.7)	5.405	0.020*
	Joint	68 (77.3)	20 (22.7)		

*p-value significance at < 0.05

Table 7: Association between socio-demographic factors & dengue prevention practices

Variables	Category	Dengue prevention practice		Chi-square	P-value
		Poor (%)	Good (%)		
Age	≤ 40 years	40 (33.3)	80 (66.7)	0.955	0.328
	> 40 years	16 (26.2)	45 (73.8)		
Sex	Male	25 (30.1)	58 (69.9)	0.048	0.826
	Female	31 (31.6)	67 (68.4)		
Caste/Ethnicity	<i>Brahmin/Chhetri</i>	24 (22)	85 (78)	10.206	0.001*
	<i>Madhesi/Janjati/Dalit</i>	32 (44.4)	40 (55.6)		
Educational status	Literate	43 (27.6)	113 (72.4)	6.021	0.014*
	Illiterate	13 (52.0)	12 (48.0)		
Family type	Nuclear	25 (26.9)	68 (73.1)	1.474	0.225
	Joint	31 (35.2)	57 (64.8)		

*p-value significance at < 0.05

Factors associated with knowledge about dengue: The association between socio-demographic factors and knowledge about dengue has been measured by using the Chi-square test. Since the p -value was <0.05 , there is a significant relationship between caste/ethnicity and knowledge about dengue (p -value =0.001) and family type and knowledge about dengue (p -value =0.020) (Table 6).

Factors associated with dengue prevention practices: Since the p -value was less than 0.05, there is a significant relationship between caste/ethnicity and dengue prevention practices (p -value =0.001) and educational status and dengue prevention practices (p -value =0.014) (Table 7).

DISCUSSION

The level of knowledge and practices of the general population are the most critical factors on preventing the infection of dengue virus^{6,7} and poor level of knowledge on the dengue transmission and its preventive methods can increase the chance of spreading dengue fever.⁸ So, this cross-sectional study was conducted to assess the level of knowledge and practices on dengue prevention and its associated factors among the people of Buddhabhumi Municipality of Kapilvastu district of Nepal.

The mean and standard deviation of the respondents' age (38.2 ± 14.46 years) in current study was comparable to the Sasaram, Bihar⁹ (42 ± 14.3 years) and Malaysia¹⁰ (36 ± 11.62 years). Results of the current study showed that the overall knowledge about dengue was good among 30.9% of the respondents. While comparing with the results of previous studies, variation and similarities in the level of knowledge about dengue has been noted. A study from Villa El Salvador, Lima, Peru reported the approximately half (54.2%) of the respondents knew that the dengue was transmitted by mosquitoes and 51.7 percent were able to identify fever and one other correct symptom of dengue.¹¹ Approximately 98.1 percent of the respondents were found aware that mosquitoes transmit dengue and 91.8 percent them knew that the dengue virus is transmitted specifically by the *Aedes* mosquito in Malasiya⁷. In a study from Bangladesh, only 27.5 percent had a good knowledge score (8 out of 11 items) and knowledge was significantly associated with education, income, and age ($p < 0.05$).¹² Similarly, knowledge of dengue was found significantly differed by age, sex, occupation and site ($P < 0.05$) in a study from Thailand¹³ and no significant association was

noted between knowledge score and socio-demographic factors in Malasiya.¹⁴ Though there is variation in results among the previous studies, result of current study falls within the ranges reported in previous literature around the world about the level of knowledge on dengue ranging from approximately 2.3 to 62.0 percent.^{15-17,20,21}

Regarding to overall dengue prevention practices, the current study reported that only 38.1 percent of the respondents had good dengue preventive practices. Previous two studies from Nepal have suggested 21.2 percent⁵ and 62.0 percent¹⁵ of the respondents had good dengue preventive. Similarly, study from Malaysia reported 49.8 percent had good dengue prevention practices¹⁰ and 32 percent good dengue preventive practices has been report in a study from Indonesia.²¹

Concerning the factors associated with level of knowledge about the dengue fever, the current study showed a significant relationship between caste/ethnicity and knowledge about dengue (p -value =0.001) and also with family type (p -value =0.020). In previous two studies from Nepal, knowledge was found to be associated with area of residence, educational level, age⁵ and age, types of family, size of family, educational level.¹⁵ Similarly, gender, education level, duration of illness and travel history were correlated with knowledge in study from Vietnam¹⁸ and education attendance was significantly associated with symptom knowledge (OR 2.56, 95% CI 1.25 to 5.44) and transmission knowledge (OR 3.46, 95% CI 1.69 to 7.57) in Villa El Salvador, Lima, Peru.¹¹ However, no significant association had been also observed between knowledge score and socio-demographic factors in study from Malasiya.¹⁴ A study from Saudi Arabia has reported about the significant association between the level of knowledge on dengue and age of the respondents (p -value =0.006)¹⁹ and level of education, marital status, socioeconomic status were found associated with the knowledge level about dengue in a study from Indonesia.²¹ In context of Nepal, age and educational level of respondent was associated with knowledge on dengue.¹⁵

Concerning the factors associated with dengue prevention practices, the current study showed a significant association between caste/ethnicity of respondents and dengue prevention practices (p -value =0.001) and also between educational status of respondents and dengue prevention practices (p -value =0.014). Only 34.2 percent and 62 percent of good practices of dengue prevention has been reported in the study from

Bangladesh¹² and Nepal respectively.¹⁵ In this context, a study from Vietnam had reported about the association between occupation, type of patient, knowledge and dengue prevention practices.¹⁸ Furthermore, socio-demographic^{2,7} and education level²⁰ related factors were found associated with dengue preventive practices in previous studies from different countries. Dengue prevention practices were associated significantly with age, marital ($p < 0.05$) in study from Malaysia¹⁴ and older respondents (>60 years and 41–60 years) had better dengue prevention practices than younger respondents (21–40 years and <21 years) (p value =0.01) in Indonesian study.²²

Due to differences in study design, research participants and sampling techniques; the results of the current study is compatible and not compatible with some of the previous studies. Based on the study design, percent comparisons are done for descriptive analysis and a Chi-square test has been used to measure the association between the variables. This is a cross-sectional study and causality cannot be established, so future research might apply to different study designs (i.e. interventional, longitudinal designs) to identify the contributing factors.

The overall knowledge about dengue and dengue preventive practices is below average among the people of Buddhabhumi Municipality of Nepal. Caste/ethnicity and family type of the respondents are the factors associated with overall knowledge on dengue. Similarly, caste/ethnicity and educational status of respondents are associated with dengue prevention practices among the respondents. So, to achieve success in dengue prevention, programs should be designed to increase level of knowledge and also the translation of knowledge domain into real preventive measures. This study could help policy makers, regulatory bodies and health managers for controlling dengue through promoting knowledge of the people and translating knowledge into practices among the people.

ACKNOWLEDGEMENTS

We acknowledge and appreciate respondents for their valuable time and kind cooperation.

Conflict of Interests: None

Source of Funding: None

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