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ORIGINAL RESEARCH ARTICLE

KNOWLEDGE AND PRACTICE ON PREVENTION AND CONTROL OF DENGUE FEVER AMONG PEOPLE AT MANGALPUR VDC, CHITWAN DISTRICT OF NEPAL

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ABSTRACT

Background: In many parts of the tropics and subtropics, dengue is endemic especially during rainfall season which is the breeding season of the Aedes mosquito. The knowledge, attitudes and practices (KAP) of the general population are the most critical factors on preventing the infection of dengue virus. Hence this study was aimed to access the knowledge and practice on prevention and control of Dengue among the people of Mangalpur VDC of Chitwan.

Methods: A cross-sectional study was done in Mangalpur VDC, Chitwan district of Nepal from Shrawan 2069 to Bhadra, 2069. The sample size of the study was 345 and respondents were the people of Mangalpur VDC. Data is analyzed by using SPSS program version 16.0 for windows.

Results: Majority of the respondents 167(48.4%) were between age group 25-39 and minority 9(2.6%) age group >70 years. The mean age of the respondents is 40 years±11. Out of 345 respondents, 176 (51%) were female and 169 (49%) were male. Majority of respondents 218 (63.2) were literate and 127 (36.8%) were illiterate. The level of knowledge regarding dengue fever was statistically significant with age (p=0.002), marital status (p=0.005), education Status (p=0.010), religion (p=0.003) and with occupation (p=0.000). The level of practice regarding dengue fever was statistically significant with marital status(p=0.003), educational status (p=0.000), occupation(p=0.000) and religion(p=0.258).

Conclusions: Lack of knowledge and improper practice towards dengue is explicit in this study. Emphasis should be more on creating awareness among people. Education intervention more effective in controlling dengue fever.

INTRODUCTION

Dengue is a mosquito-borne viral disease that has rapidly spread in most of the regions of the world in recent years. Female mosquitoes mainly of the species *Aedes aegypti* and, to a lesser extent, *Ae. albopictus*, transmit dengue virus. Up to 100 million cases of Dengue fever (DF) and 500,000 cases of Dengue Hemorrhagic Fever (DHF) and several thousand deaths are estimated to occur annually worldwide.[1] During the past decades, dengue virus emerged in South Asia and DF/DHF epidemics occurred in Bhutan, India, Maldives, Bangladesh and Pakistan.[2-7,9,10] The principal vector of dengue virus is the mosquito *Aedes aegypti.* Dengue virus is maintained in a cycle between humans and *Aedes aegypti,* domestic day biting mosquitoes.[1]

There is limited information available on dengue viral infection in Nepal. In Nepal, the first case of dengue was reported in 2004 from Chitwan district.[20] Sporadic cases were reported since 1990's in a Japanese traveler who visited Nepal and developed DF after returning to Japan. Outbreak of Dengue occurred in Nepal in 2006. From August through November 2006, the number of febrile patients increased in four major hospitals in the Terai region of Nepal: Nepalgunj Medical College, Bheri Zonal Hospital in Nepalgunj, Tribhuvan Hospital in Dang and Narayani subregional hospital in Birgunj.The clinical features in most patients were consistent with the signs of DF.[20] *Aedes aegypti* was identified in 5 major urban areas of terai region bordering with India, i.e. Biratnagar (Morang), Birganj (Parsa), Bharatpur (Chitwan), Tulsipur (Dang) and Nepalganj (Banke) during the entomological surveillance in Japnese Encephalities endemic district after the Dengue outbreak in 2006 in Nepal.[1] The larvae of *Aedes aegypti* was also recorded in Kathmandu during June 2009.[20] Hence this study was aimed to access the knowledge and practice on prevention and control of Dengue among the people of Mangalpur VDC of Chitwan.

METHODS

A cross-sectional study was conducted among the residents of Mangalpur VDC, Chitwan, Nepal. The study was conducted from Shawan 2069 to Bhadra 2069. Purposive sampling method was used to collect the data among the respondents. The total sample size taken was 345.

A semi-structured questionnaire was used to collect data from the survey population. Face to face interview was conducted. Some enumerators were hired to collect the data from all wards of Mangalpur VDC. Data was analyzed

by using SPSS program, version 16.0. Descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics were used to analyze the data.

RESULTS

Majority of the respondents 167(48.4%) were between age group 25-39 and minority 9(2.6%) age group >70 years. The mean age of the respondents is 40 years with 11 years standard deviation. Out of 345 respondents, 176(51%) were female and 169(49%) were male. Majority of respondents 218(63.2) were literate and 127(36.8%) were illiterate. Among literate 98(45.2%) can only read and write, 44(20%) had primary level education and 76(34.8%) had appeared in SLC examination. Concerning the religion of the respondents 241(69.9%) were Hindu and minority 8(2.3%) Islam. As regards to the occupation of the respondents, majority of the respondents 73(21.2%) were farmer and 70(20.3%) were housewife. There were similar percentage of respondents whom were engaged in other occupation like Gov. job in private sector and in business. As far as the number of the children were concern majority 305(88.4%) respondents had 1-3 children 32(9.3%) had no children and 8 (2.3%) respondents had more than 3 children (Table 1).

Table 1: General sociodemographic characteristics of the respondents

Characteristics	Frequency(percent)
Sex	
Male	169(49.0)
Female	176 (51.0)
Age	
25-39	167(48.4)
40-54	130 (37.7)
≥55	48 (13.9)
Education status	
Illiterate	127 (36.8)
Literate	218 (63.2)
If literate	
Can read and write	98 (45.2)
Primary	44 (20.0)
SLC appeared	76 (34.8)
Religion	
Hindu	241 (69.9)
Buddist	53(15.4)
Christian	43(12.5)
Islam	8(2.3)
Occupation	
Government service	24 (7.0)
Private service	59 (17.1)
Labour/Daily wage	47(13.6)
Farmer	73(21.2)
Housewife	70(20.3)
Businessman	48(13.9)
Others	24(7.0)
Number of children	
No children	32 (9.3)
1-3 children	305 (88.4)
≥3children	8(2.3)

Table 2: Distribution of responses on respondent's knowledge regarding treatment of dengue fever

Variable	Frequency (%)
Dengue fever treatment	
Treatable	327 (94.8)
Not treatable	18(5.2)
DF managed at home	
Can be managed	29 (8.4)
Cannot be managed	316 (91.6)
If managed at home	
Bed rest*	15 (26.8)
Paracetamol	11 (19.8)
Fluid replacement	19 (33.9)
Aspirin/Brufen	3 (5.4)
Antibiotic	3 (5.4)
Others	5 (8.9)
Visit health facility*	
No fall in body temperature	328 (28.5)
Persistent vomiting and dehydration	207 (18.0)
Body rashes	188 (16.3)
Nose or gum bleeding	70 (6.1)
Blue spot on the skin	120 (10.4)
Tarry stool	122 (10.6)
Diarrhoea	81 (7.0)
Pain abdomen	34 (3.0)

Table 3: Distribution of Responses on prevention of dengue fever

Variables	Frequency (%)
Prevention of dengue fever	
Can be prevented	248 (71.9)
Cannot be prevented	97(28.1)
Measures of dengue fever prevention*	
Prevention of mosquito bite	265 (14.3)
Use of kerosene oil	188 (10.1)
Cover water container	230 (12.4)
Avoid/remove stagnant water	229 (12.3)
Change water of flower pot	187 (10.1)
Cover water tank	197 (10.6)
Clean surrounding	185 (10.0)
Cut/trim bushes	163 (8.8)
Vaccination	20 (1.1)
Avoid dirty stagnant water	184 (9.9)

*multiple response

Majority of the respondents 248(71.9%) answered that prevention of the dengue fever is possible while 97(28.1%) answered that dengue is not possible to prevent. Regarding the measures of the dengue prevention majority 265(14.3%) answered prevention of mosquito bite as preventive measure and minority 20(1.1%) as vaccination (Table 3).

Table 4: Distribution of responses on respondent's knowledge regarding various aspects of preventive measure

Variables	Frequency (%)
Prevention of mosquito bite*	
Use of mosquito net	224 (16.3)
Use of coil/mat/liquid	268(19.5)
Use of mosquito repellent	232(16.9)
Spray insecticide	71(5.2)
Screen doors and window	180(13.1)
Wear long sleeve	141(10.2)
Cleaning surrounding	118(8.6)
Remove stagnant water	134(9.7)
Use of Kerosene oil	188(10.1)
Less than 1 spoonful	152 (44.1)
1-2 spoonful	153 (44.3)
2-3 spoonful	38(11.0)
More than three spoonful	2(0.6)
Change water of open container	
Daily	150 (43.5)
Twice a week	125 (36.2)
Weekly	45 (13.0)
Every 15 days	19 (5.5)

The highest response seen is 43.5% and lowest response is 0.6% (Table 4).

In regards to the 'yes' majority of the respondent 323(93.6%) change the water of the open container within a week, cover water tank and minority15(4.3%) respondents said they are participated in spraying of insecticide in their community. In regards to No column of statement, the majority 309 (89.6%) of respondent said that they do not clean their roof gutter (Table 5).

Table 5: Distribution of responses on preventive practices of dengue fever

Variables	Yes (%)	No (%)
Use of mosquito coil/mat/liquid	313(90.7)	32(9.3)
Use mosquito net	321(93.0)	24(7.0)
Cover household water container	305(88.4)	40(11.6)
Cover any type of water container immediately after use	172(49.9)	173(50.1)
Wear body covering clothes	157(45.5)	188(54.5)
Change the water of the flower pot twice in aweek	281(81.4)	64(18.6)
Sleep under the mosquito net even at day time	118(34.2)	227(65.5)
Netted doors and windows	124(35.9)	221(64.1)
Change the water of the open water container within a week	323(93.6)	22(6.4)
Cover water tank	323(93.6)	22(6.4)
Invert the water holding container	79(22.9)	266(77.1)
Examine discarded things that can hold water	268(77.7)	77(22.3)
Remove stagnant water	174(50.4)	171(49.6)
Clean the bushes	275(79.7)	70(20.3)
Clean your roof gutters	36(10.4)	309(89.6)
Participate in spray of insecticide in your community	15(4.3)	330(95.7)

The level of knowledge wass divided into three groups according to the cutoff point 0-40 given poor, 41-75 given Fair and >75 is given Good level. In this case majority of respondents 194(56.2%) have Fair level of knowledge and 151(43.8%) have poor level of knowledge. There was not good level of knowledge.

The level of practice wass categorized according to the cutoff point 0-50 as poor practice and 51-100 as good practice. The majority of respondents 253(73.3%) show Good level of practice and minority 92(26.7%) showed poor level of practice (Table 6).

Table 6: Distribution of respondents according to level of knowledge and practice regarding dengue fever

Level of Knowledge	Frequency (%)
Poor	151 (43.8)
Fair	194 (56.2)
Level of Practice	Frequency (%)
Poor	92 (26.7)
Good	253 (73.3)

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Table 7: Practice regarding dengue fever with socio-demographic characteristics

Characteristics	Good Practice	Poor Practice	p-value
Sex			
Male	120(71%)	49(29%)	0.338
Female	133(75.6%)	43(24.4%)	
Age category			
25-39	117(70.1%)	50(29.9%)	0.399
40-54	100(76.9%)	30(23.1%)	
≥55	36(75%)	12(25%)	
Marital status			
Unmarried	55(64.7%)	30(35.3%)	0.038
Married	198(76.2%)	62(23.8%)	
Educational status			
Illiterate	78(61.4%)	49(38.6%)	<0.001
Literate	175(80.3%)	43(19.7%)	
Religion			
Hindu	181(75.1%)	60(24.9%)	0.258
Non-Hindu	72(69.2%)	32(30.8%)	
Occupation			
Government service	20(83.3%)	4(16.7%)	<0.001
Private	44(74.6%)	15(25.4%)	
Labour/Daily wage	22(46.8%)	25(53.2%)	
Farmer	56(76.7%)	17(23.3%)	
Housewife	53(75.7%)	17(24.3%)	
Business man	42(87.5%)	6(12.5%)	
Others	16(66.7%)	8(33.3%)	

Significance level at 0.05

Table 8: Logistic analysis on level of knowledge with socio demographic characteristics

Independent variables	Unadjusted OR	95% CI (Lower - Upper)
Marital status		
Unmarried	1	0.595- 1.395
Married	1.347	
Age category		
24-54	1	0.857-2.234
≥55	1.384	
Education status		
Illiterate	1	1.144-2.773
Literate	1.781	
If literate		
Can read and write	1	0.721-2.263
Primary	1.270	
SLC appeared	1.438	0.887-2.330
Religion		
Hindu	1	1.144-2.773
NonHindu	2.064	
Occupation		
Gov./private job	1	0.151-0.478
Others job	0.269	

The level of practice regarding dengue fever is statistically significant with Marital Status(p=0.003), Educational Status (p=0.000), Occupation(p=0.000) and Religion(p=0.258) (Table 8).

In case of sex females' respondents have more likely Good practice than male on prevention and control of Dengue fever Unadjusted OR=1.263 at 95% CI= 0.783-2.037. In case of age category, age group >55 have less likely Good practice than age group 24-54 at 95% CI=0.384-0.908. In case of Educational status, there is not significant association between level of practice. Similarly, in religion, Non-Hindu group respondents seems to be less likely poor practice than Hindu group respondents Unadjusted OR=0.746 at 95% CI=0.449-1.240 (Table 9).

Table 9: Logistic analysis on level of practice with socio demographic characteristics

Independent variables	Unadjusted OR	95% CI (Lower –Upper)
Sex		
Male	1	0.783-2.037
Female	1.263	
Marital status		
Unmarried	1	1.027-2.955
Married	1.742	
Age category		
24-54	1	0.384-0.908
≥55	0.590	
Education status		
Illiterate	1	1.568-4.168
Literate	2.557	
If literate		
Can read and write	1	0.549-1.851
Primary	1.008	
SLC appeared	2.358	1.312-4.238
Religion		
Hindu	1	0.449-1.240
Non Hindu	0.746	
Occupation		
Gov./private job	1	0.151-0.478
Others	0.269	

In case of association of socio demographic variables with level of knowledge, age category was divided into two like (24-54) and >55, Adjusted OR= 0.669 at 95%CI=0.425- 1.053. Occupation is divided into two category Gov/private job holders and others job holders, Adjusted OR= 0.315 at 95% CI=0.172-0.579, Education status Adjusted OR= 1.281at 95%CI=0.791-2.076 and Religion Adjusted OR= 2.006 at 95% CI=1.214-3.314

In case of association of socio demographic variables with level of practice, education status was Adjusted OR=3.121 at 95% CI=1.803-5.404, In Marital status Adjusted OR=2.275 at 95%CI= 1.294-4.000 and about Occupation adjusted OR=1.133 at 95% CI=0.601-2.137 (Table 10).

Table 10: Association of socio demographic variables with level of knowledge and practice

Variables	Adjusted OR	95% CI (Lower – Upper)
Level of knowledge		
Age category	0.669	0.425- 1.053
Occupation	0.315	0.172- 0.579
Education	1.281	0.791- 2.076
Religion	2.006	1.214- 3.314
Level of practice		
Education Status	3.121	1.803-5.404
Marital Status	2.275	1.294-4.000
Occupation	1.133	0.601-2.137

DISCUSSION

Majority of the respondents 167(48.4%) were between age group 25-39 and minority 9(2.6%) age group >70 years. The mean age of the respondents is 40 years with 11 years standard deviation. Similar findings were present in study conducted by Naik et al.[14] The mean age of the respondents was 40 years±11. Majority of respondents 218 (63.2) were literate and 127 (36.8%) were illiterate. Among literate 98 (45.2%) could only read and write, 44 (20%) had primary level education and 76 (34.8%) had appeared in SLC examination. In contrast to our study, Koenraadt et al reported that 10% of the respondents were unschooled and almost 60% of them had education levels of primary school grade four or less.[15] In another study, Kumar et al. observed 75% of the respondents belonged to educated group.[8]

Concerning the religion of the respondents 241(69.9%) were Hindu and minority 8 (2.3%) Islam. As regards to the occupation of the respondents, majority of the respondents 73 (21.2%) were farmer and 70(20.3%) were housewife. There were similar percentage of respondents whom were engaged in other occupation like Gov. job in private sector and in business. This study was also supported by Kumar et al. which revealed that 44% of the surveyed were housewives.[8] Majority of respondents 202 (99%) had not suffered from dengue fever. Concerning the family history of dengue fever, the majority of respondents 203 (99.5%) had no family history.

Majority 255(46.4%) respondents had received information about Dengue Fever from TV/Radio and minority 9(1.6%), 7(1.3%), 3(0.5%) had received from family, Health personnel and others. A study done by Syed et al. revealed similar findings that television was identified as the major source of public information.[16] Another study done by Shuaib et al.,[17] Itrat, et al.,[18] Hairi et al. ,[19] also revealed similar findings. The total knowledge score of the respondents was 24.58 (48.2%) with 16.28 of standard deviation. However, a study done by Shuaib et al. revealed that 54.4% of participants achieved at least 80% on the knowledge score. Similarly, a study done by Hairi, et al. revealed that 68.5% of the respondents had a good knowledge of dengue. 194(56.2%) have fair level of knowledge and 151(43.8%) have poor level of knowledge. There is not good level of knowledge.

The level of practice regarding dengue fever was statistically significant with marital status(p=0.003), educational status (p=0.000) and occupation (p=0.000). This finding was supported by research conducted by Koenraadt et al. which reported that sub district, sex, age and education were significantly related with overall knowledge of dengue in both univariate and multivariate analysis.[15] Another study supporting this finding was conducted by Syed et al. stating that knowledge scores were found to have significant associated.[16]

The majority of the respondents 191 (93.6%) remove stagnant water around their house and only 13 (6.4%) don't remove. The majority of the respondents 188 (92.2%) clean the bushes around their house and only 16 (7.8%) don't clean. The majority of the respondents 87 (65.4%) clean roof gutters/ceiling water in the rainy season and 46 (34.6%) don't clean. The majority of the respondents 48 (73.8%) haven't participated in spray of insecticides in their community and only 17 (26.2%) have participated.

The level of practice regarding dengue fever was statistically significant with marital status(p=0.003), educational status (p=0.000) and occupation(p=0.000) while it was not statistically significant with religion(p=0.638). High level of knowledge and poor practice have been observed in studies too.[10-13]

Other supported finding was the study done by Naik et al. which revealed that common preventive practices that were prevalent in the community were use of mosquito repellents (46.57%), prevent water stagnation (13.01%), cleaning the house (34.93%). Very few of them practiced weekly emptying of containers (9.58%) and use of mosquito nets (11.64%).[14]

CONCLUSION

The respondents' knowledge regarding dengue fever was poor. The level of overall knowledge was statistically significant with age, sex, marital status and education status of the respondents. The half of the respondents knew about prevention of DF and around three fourth of respondents did not know about treatment of DF. Those socio demographic characteristics which are more significant with level of knowledge is seen deficit in preventive practices of dengue fever. More than two third of the respondents had good preventive practices such as use of mosquito net, covering household containers, covering water tank, invert the water holding containers, examine discarded things that can hold water, remove stagnant water around house and clean the bushes, clean roof gutters/ceiling water in rainy season. More two third of the respondents had poor preventive practices such as put kerosene oil in the air cooler water once a week, wear body covering clothing, sleeping under mosquito net at daytime and participate in insecticide spray.

CONFLICT OF INTEREST: None

FINANCIAL DISCLOSURE: None

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