

Original article

Mosquito borne diseases related knowledge, practice and behavior of people in rural and peri-urban areas of Eastern Nepal

VK Khanal¹, P Pyakurel¹, S Uprety¹, RB Rayamajhi¹, PP Gupta², A Ghimire¹, SB Singh¹,
PK Pokharel¹, SS Budhathoki¹

¹School of Public Health and Community Medicine, B. P. Koirala Institute of Health Sciences, Dharan, Nepal, ²Department of General Practice and Emergency Medicine, B. P. Koirala Institute of Health Sciences, Dharan, Nepal

Abstract

Background: Mosquito borne diseases are major health problems in rural areas even after implementation of national Vector Borne Disease Control Programme in Nepal. The information on mosquito borne diseases related knowledge, practices and behavior of the people of rural and peri-urban areas of Nepal living in endemic areas are essential to develop behavioral change communication messages and for producing policy to prevent and control mosquito borne disease in the country.

Objective: To assess knowledge, practices and behavior of the people living in rural and peri-urban areas regarding mosquito borne diseases. **Methods:** A cross-sectional study of 413 households was conducted from 10th March - 10th April, 2013 in Inaruwa municipality and Duhabi village of Sunsari District. Pre-tested semi-structured questionnaire were administered by face to face interview for data collection.

Results: Ninety four percent responded, malaria was caused by mosquito but only 21% responded as dengue and Japanese encephalitis was caused by mosquito. Malaria and filariasis were considered fatal disease by 40%; however 20% had no idea about Japanese encephalitis and dengue. More than 70% respondent had perception that mosquito bites at night only. Although use of bed-net was found to be higher; only 2% had knowledge on insecticide impregnated bed-nets. 31% of respondents didn't take medication during anti-filarial campaign supplied by government mainly due to side effects. It was observed that 61% respondents were unaware about the routine JE vaccination by Nepal government. **Conclusion:** Health education must be taken into account for communities in endemic areas to create awareness regarding prevention from mosquito borne diseases.

Keywords: disease, mosquito, Nepal

Introduction

Mosquitoes are important vectors for transmission of diseases. The mosquito borne diseases of public health importance are complex and their occurrence depends on the interaction among various biological, ecological, social and

economic factors. Though several measures for their prevention and control are complied, yet the problem density is too high with 300–500 million cases and 1.1–2.7 million deaths due to malaria alone globally per year.¹The major vector-borne diseases (VBDs) in the South-East Asia (SEA) Region are malaria, lymphatic filariasis, dengue, chikungunya, Japanese Encephalitis and Visceral Leishmaniasis (Kala-azar). The VBDs have not only adversely affected the health of the people in this region but also

Address for correspondence

Dr. Vijay Kumar Khanal

Assistant Professor

School of Public Health and Community Medicine

B. P. Koirala Institute of Health Sciences, Dharan, Nepal

Mobile: 9845133117

Email: vijaykhanal75@gmail.com

impeded overall socioeconomic development of the people and the community. Simultaneously, developmental activities without adequate attention to the environment have increased the scope and scale of transmission of Vector borne Diseases.² This study was done to assess the knowledge, attitude, behavior and practice regarding mosquito borne diseases among the local residents.

Methods

A cross sectional study on mosquito borne diseases related knowledge, practice and behavior was undertaken among the people of rural and peri-urban area of Sunsari District in Inaruwa Municipality and Duhabi Village of eastern Nepal among people aged 18 years and above purposively. The study period was from March 2013 to April 2013. A total of 413 households were chosen on the basis of study finding by A.B. Joshi & M.R. Banjara which reported that about 50% of people had knowledge about Mosquito borne malarial disease. Keeping it as reference, sample size was calculated. Adults aged more than 18 years were selected for interview from each household. If more than one adult aged 18 years or more were found in a household then the one with higher literacy was chosen as the respondent. If literacy was the same then age was given the priority. Those who did not give the consent were excluded from the study.

Data collection was done by predesigned pretested interview schedule whose face validity, content validity and construct validity were ensured by the researcher and the expert faculties from school of public health and community medicine, B. P. Koirala Institute of Health Sciences, Dharan.

The question were developed in English and translated into Nepali. The study tool consisted of questions regarding demographic characteristics of respondents, knowledge/information on mosquito borne diseases, preventive and control measure of mosquito borne diseases, availability of communication

media, preferences of communication media and different preventive and control activities conducted by different institution.

Data collection procedure

Prior to the start of the study the participants were explained regarding purpose of the study. Informed consent was obtained from them and confidentiality was ensured.

Statistical analysis

Database was prepared using excel software and accordingly data entry was done. Data were analyzed using SPSS version 11.5 .Chi-square test was used to test for significance among different variables. A p-value 0.05 was used to indicate statistical significance.

Ethical issues

Ethical clearance was obtained from Institutional Ethical Review Board (IERB) prior to the study.

Results

Out of the 413 respondents, 66.1% were in the age group >30 years. More than four fifth of the respondents (75.8%) were literate and 67.8% were engaged in some kind of work. Almost 70% respondents fell below the poverty line. Among the participants, 57.4 % of them live in Kachha house and 62% had open drainage. Half of the respondents (50.1%) disposed their waste improperly and 31.5% disposed it in covered pit.

Table 1: Socio-demographic characteristics of the respondents (n=413)

Characteristics	Frequency	Percentage
Age (Years)		
18-30	140	33.9
>30	273	66.1
Educational/Literacy status		
Illiterate	100	24.2
Literate	313	75.8
Occupation		
Not working	133	32.2
Working	280	67.8
Economic status		
Above poverty line	149	36.1

Below poverty line	264	63.9
Type of house		
Kachha	237	57.4
Pucca	176	42.6
Drainage		
Open	258	62.5
Closed	155	37.5
Waste disposal		
Throw discriminately	207	50.1
Compost pit	76	18.4
Covered pit	130	31.5

Less than two third of the respondents (61.0%) were aware about vector borne diseases through mass media like television and radio and almost similar proportion were aware by their neighbors and friends followed by health care providers (45.2%). More than two third (72.8%) believed that mosquito borne diseases as a serious health problem in the study area and 37.7% were aware about existing government preventive measures against mosquito borne diseases. (Table 2)

Almost all (98.0%) of the respondents identified dirty water followed by stagnant water (83%), old discarded vehicle tyre (6.0%) favorable for mosquito to breed and about 1% of them had no idea about breeding of mosquito. On enquiring about causative agent for disease under interest, 97% had knowledge that mosquito bite caused the disease while 12% held contaminated food and water responsible for the diseases. About 94% of them, clearly stated mosquito as a vector for malaria followed by filariasis but only 20.7% reported dengue and Japanese encephalitis as mosquito borne diseases. A total of 396 (95.8%) were aware about the chemical measures and 73(17.6%) about environmental measures as the method for prevention and control of mosquito borne diseases while 4.1% had no idea about any prevention and control measures.(Table 2)

Table 2: Awareness and knowledge regarding selected mosquito borne diseases (n=413)

Characteristics	Frequency	Percentage
Source of information		
Health personnel	187	45.2
Friends/ Neighbors	253	61.2

Media	254	61.5
Hearsay	75	18.1
Others	12	2.9
Serious problem in area		
Yes	301	72.8
No	112	27.1
Awareness about various government measures		
Yes	156	37.7
No	398	62.2
Breeding Places*		
Dirty place	403	98.0
Stagnant water	343	83.0
Discarded vehicles tyre	26	6.0
Broken bottles	13	3.0
Others	13	3.0
Don't know	3	1.0
Mode of transmission *		
Mosquito bite	399	97.0
Contaminated food and water	50	12.0
Others	3	1.0
Diseases transmitted by mosquito*		
Malaria	388	94.0
Filarial	259	62.7
JE	90	21.7
Dengue	88	21.2
Kalazar	10	2.4
Typhoid	2	0.5
Control measures*		
Environmental	73	17.6
Biological	23	5.5
Chemical	396	95.8
Integrated	6	1.4
Don't know	17	4.1

*Multiple responses

It was found that knowledge about malaria was more among females (73.5%) in comparison to males (65.4%) and the difference was statistically significant. Similarly, knowledge on Japanese encephalitis was significantly more among females (37.6%) compared to males (25.9%). Knowledge regarding filariasis was also significantly higher among females than males. Dengue was known to about 36.5% of females in comparison 12.3% of males which was also significantly different. Similarly, predictor of knowledge of malaria and Japanese encephalitis was significantly more among age group <30

years in comparison to >30years. Predictor of knowledge on dengue and filariasis was more among >30 years age group in comparison to < 30 years. Both of the association was found to be statistically significant. Literate population had more knowledge about the mosquito borne disease in comparison to illiterate population and was statistically significant.

Non-working participants had more knowledge regarding Japanese encephalitis than the working participants and the difference was statistically significant. Similarly, the association of occupation of the participants

with other mosquito borne disease (malaria, dengue and filariasis) was also statistically different. Participants below the poverty line had less knowledge on mosquito borne disease in comparison to those above the poverty line however the statistical significance was observed in malaria, JE and dengue. Similarly, participants living in Kachha house had less knowledge on mosquito borne diseases in comparison to those living in Pucca house and this association was statistically significant. **(Table 3)**

Table 3: Predictors of knowledge of selected mosquito borne diseases (n=413)

Character-istics	Malaria		P value	Japanese Encephalitis		P value	Filariasis		P value	Dengue		P value
	Yes	No		Yes	No		Yes	No		Yes	No	
Sex												
Male	159 (65.4)	84 (34.6)	0.05	63 (25.9)	180 (74.1)	0.008	75 (30.9)	168 (69.1)	0.01	30 (12.3)	213 (87.7)	<0.001
Female	125 (73.5)	45 (26.5)		64 (37.6)	106 (62.4)		79 (46.5)	91 (53.5)		62 (36.5)	108 (63.5)	
Age (Years)												
18-30	112 (80.0)	28 (20.0)	<0.001	51 (36.4)	89 (63.6)	0.04	43 (30.7)	97 (69.3)	0.03	24 (17.1)	116 (82.9)	0.04
>30	172 (63.0)	101 (37.0)		76 (27.8)	197 (72.2)		111 (40.7)	162 (59.3)		68 (24.9)	205 (75.1)	
Literacy Status												
Illiterate	60 (60.0)	40 (40.0)	0.02	20 (20.0)	80 (80.0)	0.005	24 (24.0)	76 (76.0)	0.001	05 (5.0)	95 (95.0)	<0.001
Literate	224 (71.6)	89 (28.4)		107 (34.2)	206 (65.8)		130 (41.5)	183 (58.5)		87 (27.8)	226 (72.2)	
Occupational Status												
Non-Working	90 (67.7)	43 (32.3)	0.41	48 (36.1)	85 (63.9)	0.06	47 (35.3)	86 (64.7)	0.32	26 (19.5)	107 (80.5)	0.21
Working	194 (69.3)	86 (30.7)		79 (28.2)	201 (71.8)		107 (38.2)	173 (61.8)		66 (23.6)	214 (76.4)	
Economical status												
Above poverty line	111 (74.5)	38 (25.5)	0.03	63 (42.3)	86 (57.7)	<0.001	62 (41.6)	87 (58.4)	0.1	50 (33.6)	99 (66.4)	<0.001
Below poverty line	173 (65.5)	91 (34.5)		64 (24.2)	200 (75.8)		92 (34.8)	172 (65.2)		42 (15.9)	222 (84.1)	
Type of house												
Kachha	150 (63.3)	87 (36.7)	0.004	61 (25.7)	176 (74.3)	0.007	78 (32.9)	159 (67.1)	0.02	39 (16.5)	198 (83.5)	0.001
Pucca	134 (76.1)	42 (23.9)		66 (37.5)	110 (62.5)		76 (43.2)	100 (56.8)		53 (30.1)	123 (69.9)	

Discussion

This study showed that about 61.5% of the study populations were aware about the mosquito-borne disease through media followed by friends and neighbor's (61.2%), health personnel (45.2%), hearsay (18.1%) and others 2.9% and this finding is similar to the finding by Banjara and Joshi³ in Nepal who found radio (58.1%) and television (25.4%) as the major media sources for information regarding malaria. About three fourth of the respondent (72.8%) perceived mosquito borne disease as a serious problem which was comparable to similar study done in Tanzania⁴ where almost three fourth of the study population labeled malaria as a public health problem. Both the countries are similar as both of them fall in the low income countries, the environment, sanitation, housing are also similar in rural and peri-urban areas of both the countries. More than half of the respondents (62.2%) reported that they were unaware about the existing preventive and control measure against mosquito borne diseases being taken by the local administrative/health authorities in their locality which is comparable to the finding of the study by Boratneet al.⁵ where more than three-fourth respondents reported that they were unaware about existing prevention and control measures. Thus there is a need to intensify health measures by concerned authorities for prevention and control of mosquitoes along with information, education and communication activities through all available means possible. Regarding knowledge about breeding places of concerned vector, 98% stated dirty places as a common breeding place followed by stagnant water (83%), discarded vehicle tyre (6%) and broken bottles (3%). In a similar study by Ghoshet al.⁶ major breeding places identified were drains/polluted water (66.6%), garbage (18.6%), clean water (7.8%) whereas 6.8% had no knowledge.

Almost all (97%) of the study population knew that mosquito bite caused vector-borne diseases (VBDs) under interest and this was consistent with the study by Boratne et al.⁵ where 82.9%

of them reported mosquito bite as a cause of vector borne disease. Similar finding was also observed in the studies by Boratne et al. and Joshi and Banjara³. This ignorance about causation of mosquito borne disease needs to be overcome by effective information, education and communication campaigns. On inquiring about the disease transmitted by mosquito, 94% reported malaria followed by filariasis, Japanese encephalitis, dengue, kalazar and typhoid respectively. In a study by Boratneet al.⁵ more than half of the respondent reported malaria and chikungunya followed by filariasis whereas less than 20% of them reported dengue. Chikungunya, however, isn't included in our study setting.

About 95.8% of respondents were aware about the chemical methods as measure for prevention and control of mosquito-borne disease followed by environmental measures but 5% of them knew nothing about the control measures. Khan et al.⁷ reported that 20% only knew about preventive measures in their study. Joshi and Banjara³ found that 66.7% and 48.1% of the respondents respectively reported removal of the collected water from ditches and spraying insecticides as control measures against mosquito borne diseases. Hence it is the responsibility of the government and other service providing agencies to educate people regarding the various vector borne diseases and the importance of preventive and control measures. Knowledge about mosquito borne disease was less common among males in comparison to the females in our study with all the association among various vectors borne disease (malaria, kalazar, dengue, filariasis, and Japanese encephalitis). As our survey was done during day time where most of the male counterparts have gone to work in the field or in offices, majority of the respondents where female which partly could have been the reason of more knowledge among females; though Nepal is a patriarchal society where male are promoted more than female and males are educated more than females. The reason

behind female being more knowledgeable could be due to the more problems they face in daily lives among family members due to vectors and the diseases caused by them. This finding is in contradiction to the findings of the study by Sharma et al.⁸ in Delhi and Joshi and Banjara from Nepal.

Illiterate study subjects had less knowledge regarding all mosquito borne diseases under interest compared to literate ones which was found to be statistically significant and similar results was reported by Rasania et al.⁹ from Delhi and Boratne et al.⁵ from Puducherry while contrasting finding was found by Kaona et al.¹⁰ from Zambia. The study subjects who were living in Kaccha house had less knowledge regarding these mosquito borne diseases than those living in Pucca houses. It could be due to their poor socio-economic conditions having lesser access to the means of communication. Respondents belonging to low socio-economic status were found to be less knowledgeable regarding mosquito borne disease compared to respondents from higher economic status which is similar to the findings by Yadav et al.¹¹ from Rajasthan. The reason could be due to competing priorities of food, clothes and shelter in a low socio-economic group in comparison to education, knowledge and wealth.

Limitation of the study

Small sample size and recall bias are the main limitations of this study.

Conclusions

This study revealed low level of awareness and knowledge about selected mosquito borne diseases among males, illiterate and respondents with poor socioeconomic status. Therefore, it is recommended that the reach of information, education and communication activities must be improved particularly among these sub-groups of population for better outcome. Basic information related to prevention and control of mosquitoes can be taught from school age and at the same time strong information, education and communication activities can be initiated

to address the adults in the community. Active participation of stakeholders, community volunteers and self help group members should maximize community awareness and improve the performance of National Vector Borne Disease Control Programme. This would ultimately improve the morbidity and mortality of the people of the country due to vector borne diseases.

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