

Awareness and Preventive Practices about Mosquito Borne Diseases among Adults in Bishnupur Municipal Area, Manipur

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Abstract

Background: The One Health approach recognizes that human health, animal health, and environmental health are interconnected. Mosquito-borne diseases like malaria, dengue and Japanese encephalitis (JE) are a major public health concern in developing nations including India. Assessment of knowledge and practices of community about prevention of mosquito borne diseases is important for designing and implementing any kind of community-based interventions.

Objective: The aim of the study is to assess the knowledge about mosquito-borne disease and practices regarding prevention of mosquito borne disease among adults in Bishnupur municipal area.

Methods: A cross-sectional study was conducted among adult population in Bishnupur Municipal area, Manipur, India. Households were selected on convenience basis. Data was collected using a pre-tested and semi-structured questionnaire. IBM SPSS version 21 was used for data entry and analysis.

Results: Out of 186 participants, 38.2% were in the age group of 31-40. Female participants constituted 56.5% and male constituted 43.5%. About 74% of the adults spontaneously answered that mosquitoes transmitted malaria, 20% answered dengue and 23% answered JE. 37.1% and 47.3% answered stagnant water as the breeding place for dengue and malaria causing mosquitoes respectively. All used mosquito coils and 94% used mosquito nets to prevent mosquito bite. About

59.7% had knowledge about disease through mass media and from family/friends.

Keywords: Mosquito-Borne, Manipur, Malaria

Introduction

Globally, arthropod-borne vector-borne diseases (VBD) pose a major public health challenge, with an estimated 700,000 deaths per year. Approximately 17% of the world's infectious diseases are attributable to VBD.¹ Mosquito borne diseases are important public health issue persisting in India even after decades of effort to control them. There are mainly 3 types of mosquitoes, Aedes which is a vector for Chikungunya, Dengue fever, Yellow fever and Zika, Anopheles for malaria and Culex for Japanese encephalitis and Lymphatic filariasis. These conditions are responsible for substantial global morbidity and mortality.

Malaria causes more than 400,000 deaths every year global, most of them children under 5 years of age. In India, malaria incidence in 2022 is 1.4(1.12 - 1.71) per 1000 population at risk.¹ World Health Day-7 April 2014 theme was vector-borne diseases- Small Bite Big Threat. The National Vector Borne Disease Control Program include control of 5 mosquito borne diseases. This program focuses on prevention through environmental control, health education, and community involvement. Many personal protective measures like Long-Lasting Insecticide Treated Bed Nets (LLITNs) are provided to safeguard against mosquito-borne illnesses. Another sustainable approach of "One Health" recognizes that human health, animal health, and environmental health are interconnected and that collaborative, multisectoral interventions yield better outcomes.^{2,3}

In the current scenario of alarming insecticide resistance, limited vaccine availability, and deficiency of curative resources, an integrated approach based on community

and individual participation are critical in the effective prevention and control of mosquito borne diseases.⁴ Adoption of good social and personal practices at household level is needed for elimination of mosquito breeding sites and reducing the disease incidence. Assessment of knowledge and practices of community about prevention of mosquito borne diseases is important for designing and implementing any kind of community-based interventions. Community participation in prevention of mosquito borne diseases depends on their knowledge. There is limited information on community knowledge and practices on mosquito borne diseases from Manipur. Thus, there is a need for assessing their knowledge and practices regarding mosquito borne diseases in the community.

Methods

A cross-sectional study was conducted among adult population (age ≥ 18 years) in Bishnupur Municipal area during May 2021. Wards and households were selected on convenience basis. One adult member was selected by lottery method. A pretested and semi structured questionnaire was used. Questionnaire included questions related to knowledge about mosquito-borne diseases, symptoms, biting time, sources of breeding, vaccine availability and personal protection used. Data collected was entered in IBM SPSS version 21 and analysis was done using Chi-square test for proportion. The study was approved by the Research Ethics Board of the Regional Institute of Medical Sciences (RIMS), Imphal.

Results

Out of 186 adults included in the study, 56.5% were female and 43.5% were male. Mean age of the participants were 37.58 ± 12.09 years. Age of the participants were in range 18 to 80 years. About two-

fifth (38.2%) of the participants belonged to the age group 31-40. Majority (78.5%) belonged to Hindu religion. Average family income was Rs 17182.80. (Table 1)

Only 6 participants suffered from malaria and all of them were hospitalized and treated. None suffered from JE or Dengue. Spontaneous answering for diseases transmitted by mosquitoes were malaria (74%), dengue (20%) and JE(23%) respectively. About 24% answered dusk as the biting time in dengue fever while 37.1% consider stagnant water as breeding place of dengue mosquito. About 46% answered “dusk” on mosquito biting time in malaria and 47.3% consider stagnant water as breeding place of malaria. Majority (47.8%) of the participants had no answer regarding the mosquito biting time and breeding place of JE. 91.4% answered fever as a symptom of malaria, 55.9% answered fever as a symptom of dengue and 41.2% consider fever as a symptom of JE. 62% of the participants were aware of a

vaccine for malaria, 21% were aware of a vaccine for dengue and 17% of a vaccine for JE. The main source of information for majority (59.7%) of the participants was through mass media and from family/friends. It was revealed that 79.6% had inadequate knowledge. (Table 2)

Among the various preventive measures used to protect themselves from mosquito bites, it was revealed that all participants used mosquito coil, 94% used mosquito net, 20% used long-sleeve clothing, 9% used repellent cream and 2% mesh their windows. 94% practiced elimination of stagnant water, 91% covered water tanks and 51% practiced insecticide & larvicide spraying. It was observed that 66.1% had good practice and 33.9% had poor practice. (Table 3)

Significant association were observed between some socio-demographic characteristics like age, gender and type of house with knowledge and practice regarding mosquito borne diseases. ($p < 0.05$)

Table 1: Socio demographic characteristics of study participants

Socio Demographic Variables	n (%)
Age (in completed years)	
≤30	57(30.6)
31-40	71(38.2)
41-50	35(18.8)
≥51	23(12.4)
Gender	
Male	81(43.5)
Female	105(56.5)
Religion	
Hindu	146(78.5)
Christian	6(3.2)
Sanamahi	29(15.6)
Islam	5(2.7)

Highest Educational Qualification	
Illiterate	8(4.3)
Primary school	18(9.7)
High school	100(53.7)
Higher secondary	28(15.1)
Graduate and above	32(17.2)
Type of house	
Kutcha	134(72.0)
Pucca	52(28.0)
Per capita income (Rs.)	
≤10000	64(34.4)
10001-20000	76(40.9)
>20000	46(24.7)

Table 2: Distribution of participants by response to knowledge questions

Variable	n(%)		
List mosquito borne disease	Spontaneous	Prompted	Don't Know
Malaria	139(74.7)	47(25.3)	-
Dengue	39(21.0)	106(57.0)	41(22.0)
JE	44(23.6)	53(28.4)	89(48.0)
Knowledge Questions	Malaria (N=186)	Dengue (N=145)	JE (N=97)
Mosquito biting time			
Correct	142(76.3)	1(0.7)	75(77.3)
Breeding place			
Adequate	152(81.7)	68(46.9)	16(16.5)
Symptoms			
Adequate	114(61.3)	49(33.8)	8(8.2)
Vaccine availability			
Correct	32(17.2)	11(7.6)	9(9.3)
Source of information *			
Mass media	173(93.0)		
Family and friends	121(65.0)		
Health sector	15(8.1)		
Knowledge			
Inadequate	148(79.6)		
Adequate	38(20.4)		

Table 3: Distribution of participants by response to practice questions

Practice Questions		n(%)
Meshing of windows		4(2.2)
Long sleeve clothing		37(19.9)
Mosquito nets		175(94.1)
Mosquito coils, liquid, spray, etc		186(100)
Repellent cream (odomas, etc)		17(9.1)
Insecticide and larvicide spraying		94(50.5)
Use of larvivorous fishes		1(0.5)
Covering of containers with water		170(91.4)
Eliminate stagnant water		176(94.6)
Community level participation		24(12.9)
Practice	Poor	63(33.9)
	Good	123(66.1)

Table 4: Association between socio-demographic characteristics with knowledge and practice regarding mosquito borne diseases

Variable	Adequate knowledge n (%)	Inadequate knowledge n (%)	p
Age(years)			
≤28*	15(31.3)	33(68.8)	0.031
>28	23(16.7)	115(83.3)	
Gender			
Male	23 (28.4)	58(71.6)	0.018
Female	15 (14.3)	90(85.7)	
House			
Pucca	33(24.6)	101(75.4)	0.023
Kutcha	5(9.6)	47(90.4)	
Income (in Rs)			
<10000*	8(12.5)	56(87.5)	0.052
≥10000	30(24.6)	92(75.4)	
Variable	Good practice n (%)	Poor practice n (%)	p
Age(years)			
≤28*	32(66.7)	16(33.3)	0.927
>28	91(65.9)	47(34.1)	

Gender			
Male	63 (77.8)	18(22.2)	0.003
Female	60 (57.1)	45(42.9)	
House			0.004
Pucca	97(72.4)	37(27.6)	
Kutchha	26 (50.0)	26(50.0)	
Income(in Rs)			0.127
≤10000*	47(73.4)	17(26.6)	
>10000	76(62.3)	46(37.7)	

Discussion

Out of the 186 participants, when the participants were asked to name mosquito-borne diseases, 74% could answer malaria. A study conducted in Karnataka by Akhiljith et al, 95.75% participants had knowledge, that mosquito bite is the cause of dengue, malaria, chikungunya.⁵ Amul P et al conducted a similar community based cross-sectional study in 62% answered malaria, 37.4% were not aware of any diseases and 8.8% people mentioned about Filariasis, Dengue or Japanese encephalitis.⁶ Kumar NS et al conducted a similar study in which malaria was prompted by most participants as a mosquito born disease. Word and disease malaria is known better to people than dengue and least known is Japanese encephalitis.⁷ In this study, majority (81%) had adequate knowledge about breeding place of vectors of malaria. In study conducted by Kumar NS et al, 86% knew that polluted water was a breeding place for mosquitoes. Knowing type of water collections in particular for each mosquito borne disease is important for application of disease specific prevention. Awareness was heavily skewed towards malaria compared Dengue and JE which might be because of the historical burden of malaria as well as malaria were more focussed in camps in North eastern states.

In a study conducted by Bellad A and Hukkeri S in Belagavi, it was observed that only 20.27% of the participants knew that the symptoms of mosquito-borne diseases were fever, headache and body ache but in study conducted by Kumar NS et al, majority (84.5%) knew fever and rigor as symptoms of mosquito borne diseases.⁷⁻⁸ In this study, three fifth of the participants had adequate knowledge on symptoms of malaria but for dengue and JE apart from fever they couldn't list specific symptoms. Critical gaps exist in the community which was evident as misconceptions regarding vaccines.

In this study knowledge regarding mosquito borne disease among adult population was inadequate but the practice among majority of the adult population was good. Study conducted by Suchitra et al showed that 52% had average knowledge and 61% had good practice regarding the preventive measures.⁹ Mejia et al conducted a similar study and found that high acceptable knowledge (76.8%) along with acceptable implementation of practices towards prevention of breeding of mosquitoes (58.5%) and a poor implementation of practices to prevent mosquito bites (38.3%).¹⁰ About 61% had knowledge about disease through TV and newspapers in study by Kulkarni and Biradar whereas in this study the main source of

information of the participants was mass media and from family/friends.¹¹ In this study health sector contributed minimally (8.1%) in awareness generation. This can be corrected by proper utilization of healthcare workers (e.g., ASHAs, ANMs) through structured and reliable Information, Education, and Communication (IEC) activities.

In study conducted by Amul P et al, 61.4 % were using repellents for prevention against mosquito bites and 39% not taking any preventive measure.⁶ In this study, to protect themselves from mosquito bites, all used mosquito coils, 94% use mosquito nets, 94% practiced elimination of stagnant water, 91% covered water tanks and 51% practiced insecticide & larvicide spraying. It was observed that 57.8% people use mosquito coils, 20.3% mosquito nets and 8.61% people repellants to prevent mosquito bite in study by R. R. Kulkarni and M. K.¹¹ Biradar. In this study, it was found that there is an association between gender as well as type of house with knowledge and practice regarding mosquito-borne diseases.

A critical finding of this study is the marked disparity between disease knowledge and preventive practices. While a substantial majority of participants exhibited poor/inadequate overall knowledge (79.6%), a high proportion demonstrated good preventive practices (66.1%). This suggests that their preventive behaviours are driven largely by general nuisance avoidance (i.e to avoid mosquito bites) rather than any disease-specific awareness. Also, we should consider that self-reported practice measures may be subject to social desirability bias.

Younger adults had a better knowledge compared to older which may be attributed to higher literacy, digital access. But age did not significantly affect preventive

practices across households. Males demonstrated significantly higher rates of both adequate knowledge and good practice compared to females. This highlight gender-based disparities in access to information and health literacy. Health promotion initiatives should specifically target vulnerable groups like women, older age groups, and residents of Kutcha households to address demographic disparities in health literacy.

From the study, it was found that among adult population in Bishnupur municipal community preventive practices against mosquitoes are high, but disease-specific knowledge regarding transmission, vector behaviour remains markedly inadequate. Interventions must bridge this knowledge gap to prevent seasonal outbreaks of mosquito borne diseases. Public health authorities should revamp Information, Education, and Communication (IEC) strategies, moving beyond Malaria. Grass-root level health workers (ASHAs/ANMs) and local health centers must be actively involved to replace informal media as the primary, accurate source of medical information.

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