

## Community education status on knowledge for mosquito borne diseases (Malaria, Dengue, Chikungunya) in Indore city

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### Abstract

**Introduction:** Vector borne disease like malaria dengue and Chikungunya are major public health problem in recent years

**Objectives:** To assess knowledge regarding breeding places of mosquito causing Malaria, dengue and chikungunia. To assess the Knowledge of people towards preventing Mosquito Borne Diseases (Malaria, Dengue, Chikungunya).

**Materials and Method:** A cross sectional observational community based study was carried out in different localities of Indore city. Simple random sampling technique was used to select 300 study participants of age group 18-65yr. Written Informed consent taken from the participants and pre designed, pre tested, semi structured questionnaire was used for elicit response from study participants. The data collected were analyzed and presented in table formats, charts which were obtained using excel and SPSS -22. Study duration was 6 Months. Relevant statistical test was applied and p value was calculated where ever required & considered significant when it is < 0.05

**Results:** Most of the population has been found to reside near stagnant water source, 73% the people either disagrees or doesn't know that fumigation occurs in their colony or not, 74% didn't have indoor residual spray in their houses, 54% clean their water tank within 1 month, 61% have crude knowledge about the symptoms of Malaria, Dengue and Chikungunya and they visit doctor for treatment.

**Conclusion:** Measures taken to prevent mosquito bite, Symptom knowledge, and Knowledge of suffering second time with dengue can be hazardous has significant association with the education status of study population.

**Keywords:** Community Education, Chikungunya, Dengue, Malaria.

### Introduction

Vector-borne diseases (VBD), account for 17% of the estimated global burden of all infectious diseases. Their burden and economic impact continue to be very high. In the WHO South-East Asia Region, the VBD of public health importance are malaria, dengue, Japanese encephalitis, chikungunya, lymphatic filariasis and kala-azar.<sup>1</sup> According to National Vector Borne Disease Control Programme, Annual Report 2014-15 Malaria continues to pose a major public health threat in different parts of the country, particularly due to Plasmodium falciparum due to which severity may develop and may cause fatality, if not treated early. About 91% of malaria cases and 99% of deaths due to malaria are reported from high disease burden states namely Northeastern (NE) States, Andhra Pradesh, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan and West Bengal.<sup>2</sup>

Dengue is endemic in 35 states/UTs. After 1996 outbreak (total 16517 cases and 545 deaths) upsurge of cases were recorded in 2003, 2005, 2008, 2010, 2012 and 2013. In 2010 total 28292 cases and 110 deaths have been reported. During 2012, 50222 cases and 242 deaths and during 2013, 75808 cases and 193 deaths were reported.<sup>2</sup> As per NVBDCP 2108 cases and 8deaths in 2015 and 3150cases and 12deaths were reported by dengue in Madhya Pradesh.<sup>3</sup>

During 2006, total 1.39 million clinically suspected Chikungunya cases reported in the country. Out of 35 States/UTs, 16 were affected: Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, Madhya Pradesh, Gujarat, Kerala, Andaman & Nicobar Islands, Delhi, Rajasthan, Puducherry, Goa, Orissa, West Bengal, Lakshadweep and Uttar Pradesh. In 2008, 2009, 2010, 2011 and 2012 95091, 73288, 48176, 20402 and 15977 suspected Chikungunya fever cases with nil death were reported. During 2013, 18840 suspected Chikungunya cases were reported whereas during 2014 (till November) 12694 suspected Chikungunya cases have been reported.<sup>2</sup>

As per World Health Organization, Vector-borne diseases account for more than 17% of all infectious diseases, causing more than 700 000 deaths annually. More than 3.9 billion people in over 128 countries are at risk of contracting dengue, with 96 million cases estimated per year. Malaria causes more than 400 000 deaths every year globally, most of them children under 5 years of age. Many of these diseases are preventable through informed protective measures.<sup>3,4</sup>

Malaria, Dengue and Chikungunya are diseases for which mosquito is a vector and they are one of the major public health problems in India specially last two viral diseases.

The Global vector control response (GVCR) 2017–2030 approved by the World Health Assembly (2017) provides strategic guidance to countries and

development partners for urgent strengthening of vector control as a fundamental approach to preventing disease and responding to outbreaks. To achieve this a realignment of vector control programmes is required, supported by increased technical capacity, improved infrastructure, strengthened monitoring and surveillance systems, and greater community mobilization. Ultimately, this will support implementation of a comprehensive approach to vector control that will enable the achievement of disease-specific national and global goals and contribute to achievement of the Sustainable Development Goals and Universal Health Coverage.<sup>4</sup>

Common predictors of correct knowledge about etiology and clinical features of malaria were male sex and college education. Female sex, illiteracy and tribal population were more likely to have been associated with wrong beliefs about fatality of malaria. Being tribal respondent was the single most important predictor of inadequate knowledge.<sup>5</sup> Health education must be taken into account for communities in malaria endemic areas to produce desired outcomes in malaria control.<sup>6</sup>

In Madhya Pradesh situation is not good recently we come to know that incidence of dengue, Chikungunya was increasing via various media we also confirm with local health authorities of Indore district. Indore is the business capital of Madhya Pradesh and it is important city of central India, recently Indore got cleanest city award for national authority. Even then the local population is suffering with vector born diseases. So it is essential to know the causes behind recent incidence increase of such diseases. Despite of extensive effort by various government organizations what are the reason for this situation and perception of general population regarding vector borne diseases, this study was aim to assess knowledge of people on mosquito breeding places and also towards preventing Mosquito Borne Diseases.

## Materials and Method

A cross sectional observational community based study was carried out in different localities i.e. Marimata Square, Banganga, Durga Colony, Govind Colony, Raghuwanshi Colony, Vrindawan Colony, Vishal Nagar, Platinum Paradise Colony, Nand Bagh colony, Kamla Nehru of Indore city. Study duration was 6 Months form, 01 November 2017 – 01 May 2018. Simple random sampling technique using computer generated random number table was used to select 300 study participants of age group 18-65 year. Each colony had house number and building/ flat number. Investigator firstly collected total number of houses and flats available in particular colony with the help of Nagar Nigam office. From each of randomly selected house one member based on inclusion criteria was selected. Sample size was calculated on assumption that 25% of participants were aware of different

preventing measures. Sample size was come out to be 285 with 5%  $\alpha$  error and 80% power with 95% confidence limit. This sample size was rounded as 300. Written Informed consent taken from the participants and pre designed, pre tested, semi structured questionnaire was used for elicit response from study participants. The data collected were analyzed and presented in table formats, charts which were obtained using excel and SPSS -22 (statistical package for social science). Chi square test was applied and p value was calculated where ever required & considered significant when it is < 0.05.

## Results

**Table 1: Demographic profile of study participants**

<b>Gender Distribution (N=300)</b>		
	<b>Frequency</b>	<b>Percentage</b>
Male	142	47
Female	158	53
<b>Age Distribution (N= 300)</b>		
18-25	128	43
26-30	54	17
31-35	38	13
36-40	30	10
41-45	22	7
46-50	12	4
51-55	8	3
56-60	6	2
61-65	2	1
<b>Number of Family Members (N=300)</b>		
2-4 Members	78	26
5-8 Members	208	69
9-12 Members	14	5
<b>Education Status (N=300)</b>		
Till 10th class	12	4
11-12th class	60	20
Graduate	146	49
Post graduate	82	27

In present study out of total 300 , 47 % were male and 53 % were female most of them (43%) belongs to age group 18-25yrs and 69 % having family of 5-8 members , 76% participants were graduate and above.

**Table 2: Response on previous exposure to Malaria, Dengue or Chikungunya**

<b>No. of people Suffered from Malaria, Dengue or Chikungunya</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	196	65
No	104	35
Total	300	100

65% of the Sample Population has suffered from Malaria, Dengue or Chikungunya in past.

**Table 3: Number of Households where sewage water gets collected (N=300)**

<b>Presence of Stagnant Water Source near House</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	144	48
No	152	51
No response	4	1
<b>Number of Households where sewage water gets collected</b>		
Yes	110	37
No	190	63
<b>Distance of Sewage water collection from houses</b>		
10-50m	86	29
51-100m	10	3
200-500m	14	5
No Collection	190	63

37% of sample population resides within 500m range from sewage water collection. 48% of the sample population resides near stagnant water source.

**Table 4: Response on Fumigation/residual spray (N=300)**

<b>Fumigation in Colony by Municipality</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	81	27
No	171	57
Don't Know	48	16
<b>Residual Spray in houses</b>		
Yes	78	26
No	200	66.67
Don't Know	22	7.33

Maximum (67%) of study population didn't had indoor residual spray in their houses. 26% of study population had indoor residual spray in their houses

**Table 5: Time of most Mosquito Bites Experienced and personal Measures taken by individuals to prevent Mosquito bite (Multiple responses)**

<b>Most Mosquito Bites Experienced</b>	<b>Percentage</b>
Early Morning	1
Day	5
Night	54
Evening	43
<b>Measures taken by individuals to prevent Mosquito bite</b>	
Vaporizer	15
Cream	14
Coil	31
Bed Nets	37
Screening of Windows and Doors	29
Neem Leaves Burning	2
Aerosol Spraying	28
No Measures taken	3
<b>Type of Clothes Worn at Home</b>	
Full Sleeves	3
Half Sleeves	45
Sleeveless	11
Shorts	10
Full length Pants	31

Any other type	2
<b>Types of Clothes Worn at Workplace</b>	
Full Sleeves	44
Half Sleeves	36
Sleeveless	6
Shorts	2
Full length Pants	36
Any other type	1

Maximum (54%) of study population experience most mosquito bites at night 1% of study population experience most mosquito bites in early morning. 37% of the study population use Bed Nets to prevent mosquito bites followed by Coils (31%) and Screening of Windows and Doors (29%). 3% of the study population not use any type of preventive measure. 34% of the study population wear clothes such that their body surface is completely covered at home. 80% of study population wear clothes such that their body surface is completely covered at work place.

In this study 77% of study population have water tank at home, 71% of study population has Covered Overhead Tank. 3% of study population has Uncovered Overhead Tank. 71% of study population has Covered Underground Tank. 1% of study population have Uncovered Underground Tank and 54% of study population cleans their water tank within 1 month. 85% of study population use Water Coolers in summer season and clean water coolers after summer.

**Table 6: Response on knowledge assessment of study population regarding Malaria, Dengue and Chikungunya**

	Frequency (n=300)	Percentage
<b>People having knowledge about symptoms of Malaria, Dengue and Chikungunya</b>		
Yes	182	61
No	118	39
<b>Approach preferred for Fever Management</b>		
Self treatment by Paracetamol	26	8.67
Visit Doctor (Ayurvedic or Homeopathic treatment - 26)	186	62
Home based treatment	10	3.33
Do not take any treatment	78	26
<b>Knowledge about "malaria mosquito bites early morning and evening"</b>		
Yes	92	31
No	208	69
<b>Knowledge about "Dengue &amp; Chikungunya causing mosquito bites during day"</b>		
Yes	74	25
No	226	75
<b>Knowledge about "Suffering 2nd time from dengue can be hazardous"</b>		
Yes	52	17
No	248	83

61% of study population has knowledge about symptoms. 87% of the study population visit doctor for Fever treatment. 69% of study population is unaware that malaria causing mosquito bites early morning and evening.

75% of the study population is unaware that Dengue and Chikungunya causing mosquito bites during day time. 83% of the study population is unaware that suffering from Dengue 2nd time can be hazardous.

**Table 7: Association of Education with Various Factors**

S. N.	Association of Education with Various Factors	Chi Square	P Value	Significance
1.	Suffered from Malaria, Dengue or Chikungunya	4.319	0.229	Not Significant
2.	Stagnant water source in and around house	6.412	0.093	Not Significant
3.	Sewage water collection around house	6.412	0.076	Not Significant
4.	Measures taken to prevent Mosquito bite	8.015	0.018	Significant
5.	Water tank at home	3.769	0.288	Not Significant
6.	Fumigation in colony	6.522	0.089	Not Significant
7.	Indoor Residual Spray	1.894	0.595	Not Significant
8.	Symptom Knowledge	11.776	0.008	Significant
9.	Fever Management	0.297	0.961	Not Significant
10.	Do you know Malaria Mosquito bites early morning and evening?	1.248	0.741	Not Significant
11.	Do you know Dengue and Chikungunya Mosquito bites during day?	5.482	0.14	Not Significant
12.	Suffering second time from Dengue can be hazardous	10.348	0.016	Significant

Measures taken to prevent mosquito bite, Symptom knowledge, and Knowledge of suffering second time with dengue can be hazardous has significant association with the education status of study population.

### Discussion

It is an Observational Cross-sectional study carried out in a study population of 300 of Indore City to determine the cause of rising incidence of Mosquito borne diseases (Malaria, Dengue, Chikungunya) and to assess the knowledge and attitude to prevent these diseases in Indore city.

In present study Most of the population has been found to reside near stagnant water source (Sewage line, pits, tyres, coconut shells or plastic containers etc) which may have contributed to increase in incidence of mosquito borne infection. Most of the people either disagrees or doesn't know (73%) that Malathion fumigation occurs in their colony or not, this may be due to inadequacy of Municipal Corporation and may have caused rise in incidence of mosquito borne infections. 74% didn't have indoor residual spray in their houses. Mosquito bites are experienced mostly during night and evening hours. 37% people use Bed nets followed by Coils(31%) and Screening of windows and doors(29%) to prevent mosquito bites. 34% wear type of clothes which do not completely cover body surface at home, due to which they experience much higher number of mosquito bites and this may have led to increasing incidence of mosquito borne diseases and at workplace most of the people (80%) wear clothes such that their body surface is completely covered. 54% clean their water tank within 1 month and rest either delay or do not clean, which may have caused increased incidence of mosquito borne diseases. 61% have crude

knowledge about the symptoms of Malaria, Dengue and Chikungunya and they visit doctor for treatment. Rest of the people because of lack of knowledge either delay the treatment or treat themselves with over the counter drugs. Most of the people are unaware that malaria causing mosquito bites early morning & evening, and Dengue & chikungunya causing mosquito bites during day time and that suffering from dengue 2nd time can be hazardous, due to which they may not take precautions to prevent another dengue virus infection.

Similar study conducted by Nanjesh KS et al<sup>7</sup> stated that shows that 48.5% subjects said that health authorities hadn't come for active surveillance, 41.5% visit general practitioner for consulting on their health issues, 65% used mosquito coils for protective measures and 31% used mosquito nets. Also 43% of them favoured covering containers and 32% preferred scrubbing of water containers once a week for intra-domestic antilarval activities.

Another study by Wasnik S et al.<sup>8</sup> When asked about the breeding places of mosquitoes, 56.6% said that only water can be the source for breeding places of mosquitoes whereas 50 (33.33%) said that along with water, cooler or AC, tyre, flower pots etc. can be source of water where breeding can take place. 15 participants don't know the answer for this asked question.

Study by Sreedevi et al<sup>9</sup> stated that before intervention there was fair knowledge on diseases spread by mosquitoes, breeding places, and personal protective measures among the village volunteer. Usage of PPMs was improved after education intervention among both literates and illiterates. Another study on similar topic by Kantesh Shidaraddi et al<sup>10</sup> shows in his results that The awareness regarding malaria (24.5%), dengue (15%) and Japanese encephalitis (2.5%) were considerably low as compared to chikungunya (60%).

Over half of people (50.2%), do not know the mode of transmission of these diseases. They were unaware of the breeding places (96%) and resting habitat (42.5%). The most common symptoms and the modality of diagnosis was known to very few of the respondents' i.e. 23% and 13% respectively. While, only 8% of the participant were unaware of control measures for mosquito control. The single test of proportion, Z-test showed highly significant knowledge level among the population.

With a larger sample size and greater time duration, it could have been possible to assess the attitude of large number of people towards mosquito control and their knowledge about mosquito borne diseases.

### Conclusion

In present study we found that Measures taken to prevent mosquito bite, Symptom knowledge, and Knowledge of suffering second time with dengue can be hazardous has significant association with the education status of study population.

### Recommendations

Based on present study following are the recommendations for decrease in mosquito borne diseases: Increase IEC activities through posters, radio, TV shows and advertisements, pamphlets to make people aware about mosquito control techniques. There will be Behaviour Change in people to adopt proper sanitation practices. Educating people about Dry Day (to reduce mosquito breeding). There is a need of encouraging people to follow good cleaning and sanitation practices in and around their houses.

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