



## **Awareness of Mosquito Bite and Preventive Methods Adopted against their Bites**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Mosquitoes are the utmost common disease vectors worldwide. Newly in India mosquito borne diseases have revealed as a big threat to public health specially disease like Dengue, Malaria and Chikungunya. Puducherry is said to be endemic zone for malarial spreading and other such kinds of diseases. *Anopheles*, *Aedes* and *Culex* are commonly seen in Puducherry. Therefore, considerable effects are taken to create the awareness against such kinds of insect- borne particularly, on mosquito bites made together for local citizens. The present study aimed to spread such kind of awareness and related practices on disposing mosquitoes' supporting places, their eggs for maximum prevention in Puducherry rural areas. A pilot study was conducted among the small group of people and based on it, the study questioner was prepared. The objective of the survey was to study the awareness, attributes and practices about mosquito borne diseases in urban areas and it explore various myths about mosquito borne diseases.

**Keywords:** Mosquitoes; endemic; Dengue; Chikungunya; mosquito borne diseases.

## 1. INTRODUCTION

Insect- borne diseases, particularly, mosquitoes, pose a great challenge for public health concerns in the Indian continent and Puducherry is endemic for Filariasis. But overall in India, Malaria has a large incidence. The Female Anopheles mosquito is responsible for the transmission of Plasmodium species. Aedes aegypti and its related species mainly transmit dengue fever, while Culex sp., deliberately incriminated Lymphatic filariasis transmission among the people [1].

To overcome these Vector borne diseases constantly we should educate the people about the effective control of diseases, the danger of mosquito bites and their effective preventive methods. For the control of mosquito transmitted diseases, the Government of India started The National Malaria control programme in 1952 and then renamed it as National Vector Borne Disease Control Programme in 2003 [2,3]. The studies showed that the mosquito bites characteristically vary with the tropical regions, altitude variations, medical practice, personnel and household protection among different communities [4]. For maximum prevention, a ratio of personal preventive measures is being practiced such as mosquito nets, repellants, vaporizers, screening and anti-mosquito coils. The government usually provides insecticide treated nets (ITN) for community protection and social marketing in our country. The use of ITN can be very effective against vector borne diseases especially malaria [5].

For achieving maximal malarial controlling, community level participation is an obvious requirement for such kind of organized vector control strategy programmes. Community participation is a more reliable strategy for enhancing people's knowledge, attitude toward the disease control and its prevention. The present community based study was done to find about the Awareness among the people of Rural areas of Puducherry about the harmful effects of a mosquito bites and Preventive methods against Mosquito bites

## 2. METHODOLOGY

The community based cross sectional study was conducted in Puducherry districts that are considered to be more prone to endemic malarial and dengue spreading. The present study aimed to conduct a full survey among the

households in the Rural Health Training Center catchment area of in the department of Community Medicine, Sri Lakshmi Narayana Institute of medical sciences. There are two health Centers viz., Katterikuppam and Kumarapalayam (Rural Health Training Centre) in the studied region. There are 215 families and door to door survey was conducted to visit all the households using a convenient sampling technique. The study was conducted and based on the pre designed and pre-tested Proforma. The participants were enrolled based on their willingness; the locked- house and unwilling people were excluded in the study after getting oral informed consent. The questionnaire entailed the basic questions regarding various aspects a mosquito bite, measures of prevention of mosquito bite, diseases transmitted by mosquito bite, service utilization for diseases and breeding places of mosquito in their vernacular language. The internee PG students from the Department of Community Medicine were used in the study for conducting the interviews, data collection. The data were uploaded in Excel format and translated into coding language.

## 3. RESULT AND DISCUSSION

Vectors plays a very vital role in the transmission of mosquito borne diseases and protective measures serve as one of the best strategies for prevention of these diseases. A wide diversity of individual protective measures like mosquito nets, screening, repellents, vaporizers and anti-mosquito coils serve this purpose. The Government under National Vector Borne Disease Control Programm has been introduced by Insecticide Treated Nets (ITN).

According to the World Health Organization, the estimated annual fatality rate was 2.5%, among individuals with severe dengue, with complications like hemorrhagic fever and fluid accumulation.

Personal protection measures (PPMs) have developed important device against vector borne diseases. Repellent creams, mosquito nets, mosquito coils, liquid vaporizers, mosquito killer bats, mats, smokeless coils, intense sticks, and naphthalene balls are the available personal protection measures against vector borne diseases.

Table 1 shows Age group had four categories and education attainment had three, which led to 12 different groups of age group and education

combination. According to the population percentage of each combination of age group and education, a weight was calculated for each group in the sample. The results of weighted analyses where both age group and education level were weighted were presented.

**Table 1. Sociodemographic profile of study population**

<b>Characteristics</b>	<b>No.</b>	<b>Percentage (%)</b>
<b>Age group (years)</b>		
20-30	11	5.12
31-40	67	31.16
41-50	89	41.39
51-60	37	17.21
61-70	05	2.32
71-80	03	1.40
81-90	03	1.40
<b>Gender</b>		
Male	182	84.65
Female	33	15.34
<b>Marital status</b>		
Unmarried	6	2.8
Married	207	96.3
Widow	2	0.9
<b>Educational status</b>		
Illiterates	20	9.3
Primary	148	68.8
Middle school	47	21.9
<b>Occupation</b>		
Housewives	19	8.8
Unskilled	110	51.2
Farmer	86	4.0
<b>Socio economic status</b>		
Lower	169	78.6
Middle	39	18.1
Upper	07	3.3
<b>Type of family</b>		
Nuclear	191	88.8
Joint	24	11.2
<b>Area of residence</b>		
Urban	01	0.5
Semi- urban	04	1.9
Rural	210	97.7
<b>Housing type</b>		
Pukka	100	46.5
Semi-pukka	77	35.8
Kutchha	38	17.7
<b>Overcrowding</b>		
Present	89	41.4
Absent	126	58.6
<b>Water source</b>		
Municipality tap water	139	64.7
Separate source of drinking water	76	35.3
<b>Toilet facilities</b>		
Open	76	35.3
Latrine	139	64.7
<b>Total</b>	<b>215</b>	<b>100</b>

	No.	Percentage (%)
<b>Mosquito transmit diseases</b>		
Yes	212	98.6
No	3	1.4
<b>Diseases transmitted</b>		
Malaria	18	8.4
Dengue	9	4.2
Filariasis	1	0.5
Chikungunya	2	0.9
All the above	185	86.0
<b>Breeding sites</b>		
Stagnant water	42	19.5
Open tanks, wells, and drains	7	3.3
Coconut shell	4	1.9
Ornamental ponds, aquarium	2	0.9
All the above	160	74.4
<b>The most common time for mosquito bite in your area</b>		
Night	124	57.7
Evening	62	28.8
Morning & Noon	29	13.5
<b>Breeding season</b>		
Monsoon season	182	84.7
Throughout the year	33	15.3
<b>Source of knowledge</b>		
Television/ newspaper/ radio	72	33.5
Doctor/ health worker	116	54
Friends, relatives	16	7.4
Hoarding banners	11	5.1

Table 2. Protective practices against mosquito bite

Personal protective methods adopted	No.	Percentage (%)
Mat	10	4.7
Coils	77	35.8
Nets	03	1.4
Repellent creams	09	4.2
Electric rackets	02	0.9
Sprays	04	1.9
Burning neem leaves	90	41.9
None	20	9.3

Almost 97% of study participants were using one or other personal protective measures against mosquito bite. The commercial product like coil, repellent and mat were used more among literate households compared to illiterate families, whereas mosquito net use was almost same among literate and illiterate families. Only 10% of study participants were aware about insecticide treated bed-net [6].

Mosquito coil, mosquito mat, repellent, mosquito net and traditional Neem leaf burning were the various methods of personal protective measures amongst the study participants. Most popular was the mosquito coil followed by using bed net.

This reflects that high malaria endemic districts used more of bed net compared to lower endemic districts [7].

*Anopheles* specie bites transmit the malarial parasite (Plasmodium), *Aedes aegypti* and some other species bites transmit yellow fever and dengue, while both *Anopheles* and *Culex* have been implicated for the transmission of lymphatic filariasis. Consequently the labors have been steadily made to instruct the citizens of the danger of mosquito bites to have effective control of the diseases transmitted by the arthropods chiefly mosquito. Studies have exposed that human information, boldness and repetition of

numerous approaches of individual and domestic defense against mosquito bites vary in dissimilar endemic regions of tropical countries.

Success of these measures largely depends on the access, acceptability and proper usage by the target population [5] Further, role of community participation in vector control is imminent. Community participation in turn depends on people's awareness and knowledge towards the disease and its prevention [5] Therefore, for designing evidence based effective prevention strategies, it is pertinent to study the existing knowledge of the population regarding the disease.

## CONCLUSION

Our study showed that people from urban are limitedly aware about mosquito biting time, as mosquito bites differ species wise and also geographically. Survey also high lightened awareness regarding mosquito eggs laying habitat as most of the people have good knowledge but need to clear confusion of the same. From the survey study, it also understood that regulatory methods implemented by people as control strategies were not well planned. Most of the people fully relied on repellent and chemical insecticides to get rid of mosquito biting. So, to cope with all such situations it become mandatory that government should undertake active plans to inculcate the habit of cleanliness in surrounding area. Results of this survey also indicate that approximately 50% of population have not visited government department regarding mosquito problems and also more than 70% of people are not aware about the concept of dry day.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

The study was conducted with proper approval from the Institutional ethical committee.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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