



**Original Article:**

**An Educational Interventional Study to Assess Awareness about Mosquito Breeding, Diseases Caused and Protective Measures Against them among Families Residing in an Urban Slum of Indore City.**

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**Abstract: Background:** Community participation plays an important role in control of Mosquito borne diseases. This study tries to assess impact of educational intervention on various aspects of mosquito borne diseases in an urban slum. **Methodology:** An educational interventional study was done in 200 families residing in a slum (Badi Gwaltoli) which is in field practice area of Urban Health Centre attached to Department of Community Medicine of M.G.M. Medical College, Indore. A pretested semi-structured questionnaire was administered to the Head of the family which studied their awareness and perception regarding breeding sites and biting habits of mosquitoes, diseases spread by them and personal protective measures used, followed by an educational intervention and post assessment. Data was entered into Microsoft excel spread sheet and analysed using SPSS version 20 software. **Results:** 46% of study population knew the correct breeding season of mosquitoes (monsoon season) during pre-intervention and 68% of the population post-intervention (p-value 0.004). When asked at what time mosquitoes bite the most, maximum number (92%) of people said that mosquitoes bite most in the evening and night, while only 6% and 2% were for morning and noon, respectively. Only 3.5% of the population who knew about breeding sites knew about artificial collections of water. Majority said mosquito breed in dirty stagnant water (78.5%). About 96% of the study population was aware that mosquitoes spread diseases. However, only 33.3% of respondents knew correctly about the diseases spread which improved to 68% in the post-intervention period (p-value=.000). 46% knew all

the protection measures against mosquitoes in the pre-intervention which increased to 86% in the post intervention (p.value-.005). **Conclusion:** Awareness about Aedes mosquitoes and its habits is quite poor and many people still believe that only dirty water serves as a breeding place in mosquitoes. Regular IEC sessions informing community about mosquito-borne diseases will improve community participation.

**Key Words:** Community participation; Mosquito-borne diseases; IEC

**Introduction:**

Mosquitoes constitute the most important single family of insects from the standpoint of human health. Mosquito borne diseases are prevalent in more than 100 countries, infecting 300-500 million people and causing about 1 million deaths every year (1). In India, more than 40 million people suffer from mosquito diseases annually (2). In India, malaria, filaria and dengue are the most prevalent diseases spread by mosquitoes. Presently, about 1.5 million cases of malaria and less than 1000 deaths are reported every year. About 80% of malaria burden is in Northeastern (NE) states, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Andhra Pradesh, Maharashtra, Gujarat, Rajasthan, West Bengal and Karnataka(3).

Even more astonishing is the fact that India spends 100 million dollars on malaria. In spite of spending so much, the diseases continue to explode from time to time. The reason is

that these mosquitoes develop resistance to medicines and chemicals.

Providing the knowledge about the different habits of mosquitoes, namely feeding habits, time of biting, resting habits, breeding habits etc, diseases caused by mosquitoes and different protective measures against mosquito bites and breeding, will make people more aware about mosquitoes and help them take appropriate measures at personal level like maintenance of cleanliness, hygiene, usage of bed nets, mosquito repellents etc. to protect themselves and their community from mosquito menace and diseases spread by them.

#### Aims and Objectives

- To assess the knowledge among people regarding different habits of mosquitoes i.e. their breeding places, biting habits and diseases spread by them.
- To assess their knowledge about personal protective measures against mosquitoes.
- To impart educational intervention among families in the form of lectures and discussion about mosquito related knowledge and assess its impact.

#### Methodology:

An educational interventional study was done in a slum (Badi Gwaltoli) of field practice area of Urban Health Centre attached to Department of Community Medicine of M.G.M. Medical College, Indore. There are about 2000 families residing in the slum and it was decided to evaluate about 10 percent of them. This study was done in 200 families of the area who have been residing in the area for at least 1 year selected by systematic random sampling. A pretested semi-structured questionnaire was administered to the head of the family which studied their awareness and perception regarding breeding sites and biting habits of mosquitoes, diseases spread by them and personal protective measures used. An educational intervention was done in form of lectures and pamphlets giving them required knowledge about mosquitoes and protective measures, families were re-interviewed after a month using the same questionnaire. Data was entered into Microsoft excel spread sheet and analysed using SPSS version 20 software. Appropriate statistical tests like McNemar's Chi-Square were used wherever necessary.

#### Results

##### Demographic profile of the study population

Heads of the family were interviewed to get the required data. Highest percentage of the people in our study population are in 51-60 years age group (38%) and lowest percentage in 71-80 years age group (2%). About 88% of respondent subjects were in the age group of 30-60 years. About 96% of the respondent population was males and only 8% were females. About 44% of the study population belonged to the middle class and 32% belonged to the lower socioeconomic class as per modified Kuppusswamy classification.

##### Awareness and Perception regarding various Habits of mosquitoes and diseases spread

All the respondents were aware regarding the mosquito menace in the community. Forty six percent of study population knew the correct breeding season of mosquitoes (monsoon season) during pre-intervention and 68% of the population post-intervention (p-value 0.004). Among those who were incorrect, the most common response (36%) was that mosquitoes breed throughout the year which decreased to 16% during post intervention. When asked at what time mosquitoes bite the most, maximum number (52%) of people said that mosquitoes bite most in the night, 40% were in favor of evening, while only 6% and 2% were for morning and noon, respectively. Only 56% of the respondents were aware about the breeding sites which increased to 100% in the post intervention period.

**Table 1: Knowledge about breeding sites of mosquitoes (n =112 for pre intervention and n=200 for post intervention\*)**

	Response	No. of respondents	
		Pre-intervention	Post-intervention
1.	Stagnant dirty water	88 (78.57%)	88 (44%)
2.	Stagnant clean water	4(3.5%)	4(2%)
3.	Artificial collections of water	4(3.5%)	8(4%)
4.	Running water	12(10.71%)	0(0%)
5.	Stagnant dirty water, stagnant clean water	4(3.5%)	92 (46%)
6.	Stagnant dirty water, stagnant clean water, artificial collections of water	0(0%)	8 (4%)
	Total	112 (100%)	200 (100%)

\*In the pre interventional period 112(56%) people knew about breeding sites of mosquitoes, so n=112, while in the post intervention period 200 people responded yes, so n =200 in the post intervention period.

Among 112 who knew about breeding sites of mosquito in the pre-intervention period,88 (maximum) said mosquitoes breed in stagnant dirty water while among 200 who in the post intervention period knew about breeding sites of mosquitoes, 184 said they breed in stagnant water (88 stagnant dirty water,4 stagnant clean water,92 said both). Only 3.5% of the population who knew about breeding sites knew about artificial collections of water and even in the post intervention period this did not improve much (8%).

The investigators observed that water was collected near 52% of the households. When enquired regarding the cleaning of stagnant water, 34.6% said they did not take any measures to clean, 11.6% cleaned themselves, 34.6% said that Nagarpalika cleaned it, 19.2% said they along with Nagarpalika cleaned it in the pre-intervention period .While in the post-intervention period this practice improved, 42.3% were cleaning themselves,53.8% were cleaning themselves with Nagarpalika, only 3.9% were not taking any measures to clean stagnant water (p-value=.005). When enquired if containers used for storing water should be covered, 48%strongly agreed with it in the pre-intervention period which improved to 88% in the post-intervention period (p-value=.000). On asking perception regarding weekly cleaning of water storage containers proportion of people strongly agreeing with it improved from 30%to76% and also more number of people started cleaning the stagnant water collected nearby on a weekly basis as seen in the table below.

**Table 2: Practice regarding in what time interval collected water is cleaned (n=104)**

S.NO.	Response	No. of respondents	
		Pre-intervention	Post-intervention
1.	Daily	4(3.86%)	8(7.70%)
2.	Weekly	36(34.61%)	68(65.38%)
3.	Monthly	48 (46.15%)	28(26.92%)
4.	Yearly	16(15.38%)	0(0.00%)
5.	Total	104 (100%)	104 (100%)

McNemar's test, p value-0.000 (hence test applied is significant since p-value <0.05)

About 96%of the study population was aware that mosquitoes spread diseases. However, only 33.3%of respondents knew correctly about the diseases spread which improved to 68% in the post-intervention period (p-value=.000).About 33.3% were aware that dengue and

Chikungunya are spread by mosquitoes. One of the misconceptions noted was that HIV virus is also spread by mosquito bite. 60% of the respondents said that at least one of their family members were affected by some mosquito borne disease in the last 1 year while 16% had no knowledge about the same. Amongst these 120 families, 116(96.67%) families had one of their family member affected by malaria while 4 (3.33%) had their family member affected by dengue.

**Protective measures against mosquitoes**

	Response	No. of respondents	
		Pre-intervention	Post-intervention
1.	(a)	40 (20%)	0(0.00%)
2.	(b)	12(6%)	0(0.00%)
3.	(c)	56(28%)	28 (14%)
4.	(d)	92 (46%)	172 (86%)
5.	Total	200(100%)	200 (100%)

a) Bed nets , covering of body during sleeping , & mosquito repellents; b) Bed nets, covering of body during sleeping, mosquito repellents & insecticide spraying; c) Bed nets, covering of body during sleeping, mosquito repellents, insecticide spraying & cleaning of drainages and various sanitation measures; d) Bed nets, covering of body during sleeping, mosquito repellents, insecticide spraying, cleaning of drainages cleaning of drainages and various sanitation measures & using of mosquito proof mesh for windows and doors.

As seen in Table-3, 46% knew all the protection measures against mosquitoes in the pre-intervention which increased to 86% in the post intervention (p.value-.005). 90% of the respondents were using some form of protective measures against mosquitoes in the pre intervention which increased to 100% in the post intervention. Commonly used personal protective measures were bed nets, covering of body during sleeping and use of mosquito repellants (81% use in the study population). Very few houses had any mosquito proof meshes and screens(2%) Maximum number of people got the knowledge of various protective measures from TV (60%). Other sources included doctors, health workers, newspaper advertisements, etc. Most commonly cited reason for not using any protective measure was lack of money, however those families (95%) using some form of protective measures were spending less than 100 rupees per month. With intervention, people who agreed that insecticides should be sprayed in the community in 3 months interval increased from 66 to 100%, while the degree of their agreement increased by 58% (p value-0.000). 24% of the respondents said that insecticides are sprayed near house by government, while 44% were not aware about insecticide spraying and the remaining 32% said that no such operations were done. Those who were aware of spraying operations also thought that it was beneficial however the rest of the community did not have any opinion. Insecticide treated bed nets had not been supplied to any member of the respondent population.

**Discussion**

Community participation is an important aspect of any disease control program. In order to improve community participation it is important that the members of community are aware of the diseases, its presentation, modes of spread and various methods of its prevention. For controlling malaria and other mosquito borne diseases, community participation in form of source reduction of mosquito breeding places and appropriate use of personal protective measures becomes important. This study was done in Heads of family as they are the important decision makers for all issues concerning their family. Hence it becomes important

to also assess their knowledge about habits of mosquitoes, the diseases spread and protective measures against it.

Everybody in the respondent population was aware about the mosquito menace. Forty six percent of study population knew the correct breeding season of mosquitoes (monsoon season) during pre-intervention which increased to 68% in the post-intervention (p- value 0.004). The general perception of people was that mosquitoes breed throughout the year. But it becomes important to explain that all mosquito borne diseases increase during the monsoon season and that they should be more vigilant with regard to these diseases during this season. When asked at what time mosquitoes bite the most, maximum number (52%) of people said that mosquitoes bite most in the night, 40% were in favor of evening, while only 6% and 2% were for morning and noon, respectively. This shows awareness about aedes mosquito is very poor which is a typical day biter. About 56% of the population knew about correct breeding sites which was less than a study done in [i]Gujarat in 2011 where about 69% knew about the proper breeding sites and similar to study done in Karnataka where 55% of the population knew about breeding sites. Among those who were aware, very few were aware regarding clean water and artificial collection of water as breeding places (7%) which was similar to the previously quoted studies(4,5,6.). This indicates there is a continued need to sensitize people regarding clean water and artificial collections of water also serves as sources for breeding place for mosquitoes. The local anganwadi worker informed the investigators that IEC activities are done with regard to mosquito borne diseases during the transmission season. In spite of this a poor knowledge level of breeding places indicates need for more frequent and intensive IEC activities in this field.

The investigators observed that water was collected near 52% of the households, amongst them 34.6% of them did not take any measures to clean it, which reduced to 4% after intervention (p-value=.005). When enquired if containers used for storing water should be covered, 48% strongly agreed with it in the pre-intervention period which improved to 88% in the post-intervention period (p-value=.000). On asking perception regarding weekly cleaning of water storage containers proportion of people strongly agreeing with it improved from 30% to 76% and also more number of people started cleaning the stagnant water collected nearby on a weekly basis. All these findings reinforce the fact that if we educate the community importance of any activity and its implication, it will be followed and regular IEC activities will sustain it.

Though 96% of respondents knew that mosquitoes spread disease, correct knowledge of diseases spread by mosquitoes was quite poor (33.1%) in the pre-intervention and it improved to 68% in the post-intervention. About 70% the respondent populations were aware about malaria but knowledge of dengue, Chikungunya was poor which was similar to study done in Gujarat(4) and many incorrectly thought even HIV was spread by mosquitoes.

Our study population were aware of commonly used protection measures like bed nets, mosquito repellents etc and most of the study population was using some form of protective measures. This may be because of advertisements in mass media, previously held education sessions and this improved with our present educational intervention. This shows that IEC activities play very important role in any disease control program. Many people were not aware of insecticide spraying operations because generally insecticide spraying is done only when the area reports of outbreak of mosquito-borne diseases. None of the respondent population knew about insecticide treated bed nets as they were not provided to the families. Generally the insecticide treated bed nets are provided to the tribal areas such as Jhabua district in

Madhya-Pradesh where the prevalence of falciparum as well as vivax Malaria are high in the community.

#### **Conclusion and Recommendation**

Awareness about Aedes mosquitoes and its habits is quite poor and many people still believe that only dirty water serves as a breeding place in mosquitoes.

An education interventional session was useful in improving knowledge on all aspects of mosquitoes. Hence it is recommended that intensification of IEC sessions informing the community about various habits of the mosquitoes would be very helpful in control of diseases spread by them. These sessions should be more frequent during the transmission season.

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