Knowledge, attitude and practices regarding mosquito borne diseases among adults in Udupi District, Karnataka

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Abstract

Context: The mosquito-borne diseases result in avoidable ill-health and death which has been emphasized in Sustainable Development Goals. Despite sincere integrated vector management programs, the incidence of mosquito borne diseases is still increasing, part of which can be attributed to lack of community participation. Hence this study was carried out to understand the level of knowledge of the community, their attitude and practices regarding prevention of mosquito borne diseases.

Materials and Method: Across-sectional study was conducted amongurban, rural, slum and tribal areas in Udupi district, Karnataka. A pre designed questionnaire was used to collect the data on socio-demographic characteristics and details regarding knowledge, attitude and practices. The presence of any mosquito larvae and breeding sites were observed and noted. Data was entered and analyzed by using SPSS version 16.

Results: A total of 451 families were surveyed. Majority (84%) knew stagnant water is major breeding site for mosquitoes. Nearly half of the population (47.2%) preferred to use mosquito coils and mats to control mosquitoes followed by liquid vaporizer (40.4%). Approximately 60% of the houses did not have stagnant water in the surroundings and 40% of the houses had routine mosquito control activity undertaken by the government or municipality.

Conclusion: The knowledge regarding mosquito borne diseases was inadequate and there is a need to conduct awareness programs regarding the diseases spread by mosquitoes, mainly in the slum and tribal areas and to enhance the community participation in implementing preventive measures for the same.

Keywords: Mosquito borne diseases, Awareness programmes, Community participation

Introduction

The mosquito borne diseases comprise a major public health concernworldwide. They are complex with the common mosquito borne diseases in India being malaria, dengue, chikungunya, filariasis, and Japanese Encephalitis. Different species of mosquitoes act as vectors for a number of arboviruses (arthropod-borne viruses) and parasites that cause these dreadful diseases. The occurrence of disease depends on the interaction of various biological, ecological, social and economic factors. The problem density is too high. Malaria, dengue and other vector-borne conditions were estimated to account for 1.6% of India's total disease burden (WHO 1998).[1] Malaria is endemic in 91 countries, with about 40% of the world's population at risk. Dengue is the world's most important mosquito-borne virus disease, with 2500 million people worldwide at risk of infection and 20 million cases a year in more than 100 countries. Lymphatic filariasis (elephantiasis) infects about 120 million people in tropical areas of Africa, India, South-East Asia, the Pacific Islands and South and Central America.[2] 22% (275.5millions) of India's population live in high transmission (>1 case per 1000 population) areas and 0.7–1.6 million confirmed cases and 400-1,000 deaths occur annually (3). The Karnataka state in India is endemic for malaria, dengue, lymphatic filariasis and Japanese encephalitis- all mosquito-borne diseases. The incidence of malaria in Karnataka in 2015 was 12335, with 8240 cases in Dakshin Kannada.[3]

The situation has become much complicated by the rapid urbanization, construction activities, industrialization without proper drainage facilities and development of supporting infrastructures like roads without keeping in mind the natural flow of surface water. Slums in towns & its periphery are the worst affected because of lack of water management and appropriate anti-larval operations. The mosquito-borne diseases result in avoidable ill-health and death which has been emphasized in National Health Policy,[4] Millennium Development Goals (MDGs 6)[5] and recently Sustainable Development Goals (SDG3.3).[6] National Vector Borne Disease Control Programme (NVBDCP)[7] is one of the most comprehensive programmes for the prevention and control of mosquito-borne diseases. To control these diseases, it is important to consider the behavior of the vectors of these diseases. The actions of the predisposed community also plays an essential role in the incidence and transmission of infectious diseases.[8] Despite chemical, biological, mechanical or integrated vector management programmes, the incidence of mosquito borne diseases is still increasing, part of which can be attributed to lack of community participation in many places. In spite of mass communication and education, community participation is far below expectation. Community participation in turn depends on peoples'

awareness, knowledge and attitude towards the disease. For developing a suitable and effective health education strategy, it is crucial to understand the level of knowledge of the community, their attitude and practices regarding mosquito borne diseases. Therefore this study aimed to assess the knowledge, attitude and practices regarding mosquito borne diseases among adults in the sample population of Udupi district.

Materials and Method

A cross-sectional study was conducted during February and March 2016, after obtaining the Institutional Ethics Committee clearance. The study included households from urban, rural, slum and tribal areas in Udupi district. Any one of the consenting family member, ≥18yr of age, from the identified households, were included and interviewed in the study, preferably the head of the household.

Sample size was estimated using the formula $4pq/d^2$, where p is the proportion the awareness regarding mosquito borne diseases to be 50%[12] with precision of 15%, considering design effect of 1.5% and 10% non-response rate, a sample of 302 households had to be covered in urban, rural, slum and tribal households. Written informed consent was taken and data was collected from responding family members who were identified based on inclusion criteria. A pre-designed proforma was used to gather socio-demographic characteristics of the subject which included information regarding age, gender, marital status, literacy, occupation, socio-economic status. Socio-economic status of the family was assessed by using family income and type of ration card. Knowledge regarding diseases transmitted by mosquitoes, breeding places, time of biting, symptoms of mosquito borne diseases, knowledge regarding preventive measures, protective measures employed by family & their health seeking behavior were enquired. The investigators looked for the presence of any mosquito breeding site/sites within or around the house and examined if there were any mosquito larvae.

Data analysis: The data collected was tabulated and analyzed by using Statistical Package for Social Sciences (SPSS version-15) for windows. Results are described in the terms of proportions and their 95% confidence intervals. Continuous data was summarized using mean and standard deviation. Knowledge, attitude and practice scores were calculated by assigning one positive score for each positive response and then adding the combined score on each aspect for each respondent. P value <0.05 was considered to be statistically significant.

Results

A total of 451 families were interviewed during the study. As shown in Table 1, urban, rural, slum and tribal households constituted 32.4%, 34.8%, 15.7% and 17.1% respectively of the sample, selected in proportion to the population of the area. Among respondents 74.9% were females. Mean age of the respondents was 41.03(± 14.8) years. Hindu households constituted 80% of the total. Most of the respondents were literates (86.3%). 51.7% of respondents were housewives. 57.9% of the houses were pucca while 19.5% of the houses were kutcha and 22.6% were mixed. Only 339 (75.5%) of the houses had adequate ventilation and 69.3% had adequate light. Overcrowding was present in 26.3% of the households.

Table 1: Socio-demographic details of the study population

Socio demographic factors	Frequency	Percentage
Location		
Urban	146	32.4
Rural	157	34.8
Slum	71	15.7
Tribal	77	17.1
Gender		
Male	113	25.1
Female	338	74.9
Religion		
Hindu	361	80.0
Muslim	66	14.6
Christian	23	5.1
Others	1	0.2
Education		
Illiterate	62	13.7
1 - 4 std	56	12.4
5 - 7 std	129	28.6
8 - 10 std	107	23.7
PUC & above	97	21.5
Occupation		
White collared	20	4.5
Skilled	25	5.5
Semiskilled	66	14.6
Unskilled	58	12.9
Housewives	233	51.7
Student	11	2.4
Unemployed	38	8.4
Socio economic status as per ration card		
APL	139	30.9
BPL	261	58.0
No ration card	50	11.1
Missing	1	

Table 2: Water Source, Waste Disposal and Drainage in the Areas

	Urban	Rural	Slum	Tribal	Total
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Source of drinking water					
Well	60(41.1)	94(59.9)	66(93.0)	25(32.5)	245(54.3)
Bore well	79(54.1)	7(4.5)	1(1.4)	18(23.4)	105(23.3)
Municipal supply	20(13.7)	99(63.1)	5(7.0)	43(55.8)	167(37.0)
Waste dumping					
Community dumping	55(37.7)	122(77.7)	9(12.7)	19(24.7)	205(45.5)
Burning	77(52.7)	13(8.3)	8(11.3)	38(49.7)	136(30.2)
Indiscriminate dumping	17(11.6)	9(5.7)	32(45.1)	11(14.3)	69(15.3)
Dump in pit	10(6.8)	8(5.1)	23(32.4)	13(16.9)	54(12.0)
Drainage					
Open drains	68(46.6)	74(47.1)	46(64.8)	48(62.3)	236(52.3)
Soakage pit	26(17.8)	51(32.5)	5(7.0)	11(14.3)	93(20.6)
Closed Public drains	47(32.2)	28(17.8)	20(28.2)	16(20.8)	111(24.6)

As shown in Table 2, well water along with bore well was the major source of drinking water in urban areas, while municipal supply and well were the major sources in rural areas and community wells were the common source of water supply in slum areas. Greater proportion of the population relied on community dumping (45.5%) and burning (30.2%) for waste disposal. Open drains was the common drainage facility (52.3%) followed by closed public drains and soakage pits.

When asked about breeding places of mosquitoes, majority (84.7%) felt stagnant water is the most common, followed by garbage (27.5%), rain water collection (14.9%), decaying organic matter (12.2%), vehicle tyres (6.2%), ponds & tanks (4.7%) and wells (2.9%). Nearly 5.3% did not have any idea on breeding places. 76.1% of the respondents said that mosquitoes rest outdoors, 40.4% said indoors and 4% in cattle shed. When enquired about biting time, 74.3% felt mosquitoes bite at night, 47% in the evening and 3.3% said during day time. On enquiry into the knowledge regarding symptoms of the disease, 77.4% answered fever while 23.3% of participants replied headache. Joint pain and body ache were also common symptoms that people mentioned. The respondents knew that there are different ways of controlling mosquito borne diseases and gave multiple answers. They listed mosquito coils usage (47.9%), keeping clean surroundings (47.5%), using bed nets (28.4%), draining water from collection (25.3%) and spraying chemicals (14.2%). Others included spraying, not allowing water collection. Liquid vaporizer (40.4%) and mosquito nets (29.5%) were widely preferred for personal protection.

Abiding by the facts, 73% of the population considered malaria as a dangerous disease. Major proportion of the people (74.5%) consulted doctor for treatment if they had fever. Of these 39.3% went immediately and 35.6% waited only for a day before seeking medical help. 92.5% of the population preferred allopathic medicines for treatment. Mosquito coils and mats (47.2%) followed by liquid vaporizers (40.4%) were common personal protection measures practiced. Most of them (80%) didn't do anything to clean the stagnating water, some of them apply bleaching powder.About 48% respondents used to invert the coconut shells while drying before disposing off. 47.7% people generally cleared the weeds around their houses. 38% of the residents cleaned their water tanks regularly. Majority of respondents didn't have used tyres in their household. Only a small proportion of people (15%) used to apply mineral oil over water collection around their place.

Table 3: Source of Information

Source	Urban No. (%)	Rural No. (%)	Slum No. (%)	Tribal No. (%)	Total No. (%)
Health worker	50(34.2)	90(57.3)	45(63.4)	36(46.8)	221(49.0)
Radio	8(5.5)	9(5.7)	0	0	17(3.8)
Telvision	101(69.2)	104(66.2)	4(5.6)	34(44.2)	243(53.9)
Friends, neighbors	42(28.8)	32(20.4)	16(22.5)	14(18.2)	104(23.1)
Newspaper	58(39.7)	40(25.5)	2(2.8)	12(15.6)	112(24.8)
Banner/poster	10(6.8)	3(1.9)	2(2.8)	3(3.9)	18(4.0)
School	1(0.7)	2(1.3)	8(11.3)	0	11(2.4)

Television (53.9%), followed by information by health worker (49%), newspapers (24.8%) and friends or neighbours were found as the common sources of information (Table 3).

Among 451 households visited, 91(20.2%) houses had at least one member who travelled to foreign countries and only 3.3% of them got any health advice from health personnel. In last six months health workers visited 286(63.4%) of these houses to check for any fever cases. When asked about malaria surveillance in the community, 202(44.8%) respondents observed such activities happening regularly in their areas, irregularly in 59(13.1%) and seasonally in 41(9.1%). 183(40.6%) said that mosquito control measures were taken by government and municipality regularly. The common methods for control were spraying and fogging. However, 54(12%) respondents said that they have control measures adopted by local community like keeping surroundings clean, spraying chemicals, increasing awareness about usage of mosquito nets and coils etc. which is appreciable.

Table 4: Observations around Household (n = 451)

Observation	No.	Percentage
Presence of stagnant water	174	38.6
Presence of mosquito larvae	100	22.2

Further, as shown in Table 4, while investigating the surroundings and inside of houses, stagnant water was found there in 38.6% of households, while mosquito larvae were noted in the water collections in 22.2% of households.

Table 5: Distribution of Good Knowledge, Attitude and Practice according to area of residence

		Urban	Rural	Slum	Tribal	Total	P-value
		No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	
Knowledge	Good	80(55.2)	68(43.3)	11(15.5)	17(22.1)	176(39.1)	0.0001
	Poor	65(44.8)	89(56.7)	60(84.5)	60(77.9)	274(60.9)	
Attitude	Good	59(41.0)	72(46.2)	19(27.5)	38(50.0)	188(42.2)	0.394
	Poor	85(59.0)	84(53.8)	50(72.5)	38(50.0)	257(57.8)	
Practices	Good	32(25.0)	48(35.3)	00	13(20.3)	93(26.1)	0.074
	Poor	96(75.0)	88(64.7)	28(100)	51(79.7)	263(73.9)	

Thus, as Table 5 depicts, 39.1% of the respondents had good knowledge regarding mosquito borne diseases, with a significant proportion of participants in urban areas having good knowledge. At the same time a greater proportion of participants in slum and tribal areas displayed a poor knowledge regarding mosquito borne diseases. Further, 42.2% of participants had appreciable attitude regarding the control of mosquito borne diseases, in addition to health seeking behavior. However 72.5% of participants residing in slum areas had poor attitude regarding same. It was also noted that, while 26.1% of the respondents practiced one or the other methods of prevention and control of mosquito borne diseases, the participants residing in slum areas practiced none.

Discussion

In the present study, malaria and dengue were the most common diseases perceived by the participants as mosquito borne diseases. About 80% of the respondents did perceive mosquitoes as a problem and 73% felt malaria as a dangerous disease. Whereas, a study done in Bangalore showed about 93.5% of the respondents in the urban sample and 99.3% in the rural sample did perceive mosquitoes as a problem.[9] This shows that there are still some lacunae in knowledge of mosquito borne diseases. Mean age of our study participants as observed was close to that found by Vala M et al and Dhaduk K M et al.[10,11]

In the present study we observed that majority of the houses had adequate ventilation (75.5%), while Kumar BA et al in a similar study, found majority of houses to be poorly ventilated (81.6%).[12] He also found overcrowding in 65% of the households which is in quite contrast to our study findings (26.3%). This contrast can be a result of good housing standards and practices in the study area which can be improved with more effort. Boratne et al found in a similar study done in Puducherry, that closed underground drains (59.5%) was the common drainage system followed by open drains (37.87%) and soakage pits (2.63%),[13] which is different from the present study results where open drains constitute the common drainage system. He also found indiscriminate dumping (63.14%) as the commonest mode of waste disposal,[13] while community dumping collected by municipality was more common mode followed by burning of refuse noted in our study.

Similar to our results, Mukherjee et al, Ravi Kumar et al, Vala M et al, Boratne et al and Mehta et al found that polluted and stagnant water collections and drains were the common breeding places.[8,9,10,13,14] Similar to

our results Ravi Kumar et aland Mehta et al found night time as main biting time, while on a slight variation evening followed by night time were the commonly reported biting times by Mukherjee et al.[8,9,14] Similar to the our results fever was reported as the most common symptom in studies by Mukherjee et al, Ravi Kumar et al, Vala Met aland Dhaduk M et al.[8,9,10,11] Majority of respondents (74.5%) consulted doctor on having fever, which is similar to that found by Mukherjee et al in Bankura, West Bengal, but is slightly less than that found in a similar study done by Mehta et al (88%) in Bhavnagar, Gujarat and[8,14] Liquid vaporizer, mosquito coils and mats were found to be common protective measures perceived by urban, rural and tribal people whereas predominantly mosquito nets by slum dwellers. The results are consistent with the findings of Taskande et al in a similar study in Wardha, Maharashtra and Vala Met al in Gujarat.[10,15] Only 4.7% of households observed in our study didn't use any method of personal protection which is better than that found by Dhaduk M et al (16.89%).[11]

In our study, we found that the source of information regarding mosquito borne diseases varied significantly in different areas. Television, friends, neighbors and newspapers were main sources in urban whereas health worker and mass media (including television) werethe sources in rural areas.Kumar B A et al also had reported similar findings in a study done in Guntur, Andhra Pradesh where television was the commonest source of information (58%), followed by friends (26%) and newspapers (10%).[12] Different findings were reported from a study done in Bankura district, West Bengal by Mukherjee et al, where schools were the major source of information in urban areas, while observation of other sick people was the source in rural areas.[8]

Present study showed that only 20.2% houses had at least one member who travelled to foreign countries of whom only 3.3% of got any health advice from any health personnel. These findings are in a big contrast to the findings of Wilder-Smith A et al in Australasia, where they reported that 31% respondents had sought pre-travel health advice and 4% even sought advice from the travel medicine specialist.[16] Hence we are still far from providing access to travel medicine clinics to majority of population. Active malaria surveillance activities were totally lacking in 33% of the surveyed houses which is better than that found in a study done in Central India by Dhaduk M et al where it is lacking in nearly 58% of houses.[11] Our study observed that 38.6% of the households had mosquito breeding siteswhereas in the study done by Dhaduk K M et al in Jamnagar, Gujarat, only 26.67% of the houses were reported to have such sites.[11] Hairi F et al in their study to assess knowledge, attitude, and practices of people regarding Dengue in Kuala Lumpur found that 68.5% of the respondents had a good knowledge of dengue and Aedes, while 91.5% had a good attitude towards dengue control and 51.5% adopted measures to prevent and control the disease.[17] These results are much higher than that found in our study using similar scoring methodology. This shows the necessity to make the population aware of the preventive and control strategies and motivate them to adopt and practice same more actively.

Conclusion

Among the respondents, 39.1% of the people had good knowledge regarding mosquito borne diseases. Most people surveyed knew about mosquito borne diseases like malaria, dengue and chikungunya. However the population lacked information regarding Zika virus and yellow fever. Greater proportion of the study population was found to use protective measures like coils, repellents against mosquitoes. 26.1% of the people practiced one or the other methods of prevention and control of mosquito borne diseases, while participants residing in slum areas practiced none. Community participation pertaining to the matter was also very poor.

Limitations

Since the survey was done in the month of February, which is not the breeding season of mosquitoes, accurate data regarding the presence of mosquito larvae in the surroundings wasn't obtained. As the survey was undertaken during the working hours, knowledge, practice and attitude of the youth could not be gauged.

Recommendations

There is a need to conduct awareness programs regarding the diseases spread by mosquitoes and other vectors, mainly in the slum and tribal areas. Further, frequent awareness programmes can motivate community to practice mosquito control measures.

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