

Original Article**Knowledge and Practices regarding commonly occurring mosquito borne diseases among people of urban and rural areas of Rajkot District, Gujarat**

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ABSTRACT

Background: People's knowledge and awareness towards the disease can help in the formation of the design of Behaviour Change Communication campaigns to influence acceptance and use of any control measures.

Aims: To study the knowledge and practices regarding commonly occurring mosquito borne diseases among people of urban and rural areas of Rajkot District.

Material and Methods: Multistage sampling method was used. Total 432 households, 216 each from urban and rural areas, were studied. Selection of areas was based on Annual Parasite Incidence. Six areas from urban and six talukas from rural areas were studied. Data were collected using a pretested semi structured questionnaire during the high transmission season (July 2011 to October 2011) of mosquito borne diseases. Data were entered in Microsoft Excel and analysis was done using Epi Info 6.

Results: 87.96% respondents knew that mosquito transmits malaria. 75.93% respondents did not know how dengue is transmitted. Fever (95.60%) and chills (71.06%) were the most common malaria symptoms told by respondents. 85.65% respondents were not knowing about dengue symptoms. 48.84% told joint pain as chikunguniya symptom. 90.05% respondents associated water collection to mosquito breeding place. 90.51% respondents knew that mosquito borne diseases can be prevented by using personal protective measures. 23.84% of the respondents did not use anything for prevention against mosquito bites.

Conclusion: Knowledge regarding malaria was found satisfactory but knowledge regarding other mosquito borne diseases was unsatisfactory. Knowledge regarding prevention of mosquito borne disease was good and majority of the households were using preventive measures against mosquito bites.

Key words: Mosquito borne diseases, Knowledge, Practice, Rajkot, Gujarat

INTRODUCTION

The mosquito borne diseases of public health importance are complex and their occurrence depends on the interaction of various biological, ecological, social and economic factors. The mosquito-borne diseases results in avoidable ill health and death which also has been emphasized in National Health Policy and Millennium Development Goals (MDGs) in India. National Vector Borne Disease Control Programme (NVBDCP) under the aegis of National Rural Health Mission (NRHM) is one of the most comprehensive and multifaceted public health activities in India including prevention and control of mosquito-borne diseases [1].

In recent years, vector-borne diseases have emerged as a serious public health problem in countries of the South-East Asia Region, including India [2]. During 2010, Gujarat state reported a total of 66,501 malaria cases including 13,729 plasmodium falciparum cases and 71 deaths. From this, Rajkot district reported 2473 malaria cases including 463 plasmodium falciparum cases and 6 deaths and Rajkot Municipal Corporation reported total 499 malaria cases including 198 plasmodium falciparum cases and 1 death. In the same year Gujarat reported 2568 dengue cases with 1 death, among these Rajkot District reported 95 cases and Rajkot Municipal Corporation (RMC) reported 211 cases. Total 1709 clinically suspected chikunguniya cases were reported from Gujarat in 2010 and

Rajkot District reported 68 cases and RMC reported 52 cases [3]. Environmental control offers the best approach to the control of mosquitoes. Source reduction is potentially the ideal method for controlling mosquito. It is the method applied to prevent breeding of mosquito, by means of taking care of the larval breeding sources. It requires public motivation through health education and usually legislation and law enforcement to encourage community participation. Community participation is essential for the prevention and control of an outbreak of mosquito borne disease [4].

In spite of mass communication and educational approaches, community participation is far below expectation. Community participation in turn depends upon People's knowledge, awareness and attitude towards the disease [5]. Several socioeconomic studies in various countries indicate variation in knowledge and practice related to mosquito-borne diseases [6, 7, 8]. Most organized vector control strategies require public support of one kind or another and the extent of people's cooperation can determine the success or failure of the entire campaign [9]. Program implementers need to understand the disease-related knowledge, attitude, and practices of the community, because these are the important determinants of community participation [10].

Despite of so many efforts to control malaria, dengue and chikunguniya, these diseases are still having a huge impact on health, wellbeing and economy of the people. Key success for mosquito borne diseases control depends not only on services provided by Health Authority but also on knowledge on clinical manifestation, awareness and early care seeking behaviour of the community. There is a need to know existing knowledge and practice regarding mosquito borne diseases and its control in community.

MATERIAL AND METHODS

A cross-sectional study to assess the knowledge and practices regarding mosquito borne diseases was conducted among people of urban and rural areas of Rajkot district. Study was conducted during high transmission period i.e. July 2011 to October 2011, so appropriate aspects of malaria can be studied. A household is considered as a sample unit. Total 432 households [Since p value from previous studies on the topic of present study is not available, so an anticipated p value is taken which should be 50% as per WHO practical manual on sample size

determination in health studies by S. K. Lwanga and Lemenshaw (1991). So taking p 50% and allowable error (l) 10% of p in formula $4pq/l^2$, a sample size of 400 would be needed. To improve the precision further a total of 432 household were studied] including 216 from urban areas and 216 from rural areas, were studied. Multistage sampling method was used to select households. In 1st stage, it has been decided to study Rajkot city for urban study and three randomly selected talukas of Rajkot district for rural study. Rajkot city is divided into three zones and these three zones were studied as urban areas. Three different talukas of Rajkot district were selected randomly as rural areas. These were Rajkot, Jetpur and Gondal. In 2nd stage two urban slums in each zone and two villages in each taluka, one of which having highest API (January 2011 to May 2011) and another one having lowest API (January 2011 to May 2011) were selected. If more than one area having same API then area was selected by random selection method. (API of different areas was obtained from Rajkot Municipal Corporation and Rajkot Jilla Pachayat). In 3rd stage 36 houses in each six urban slum and each six rural area were studied to study a total of 432 household in urban and rural areas. In 4th stage each study area (slum area/ village) was divided in 4 quadrants and 9 houses from each quadrant were selected for study. From the centre of the quadrant one house was selected randomly and remaining houses were selected as the nearest door of previous household.

RESULTS

Total 432 respondents were interviewed and mean age of the respondent was found to be 34 years with standard deviation of 10.35 years. Almost half respondents i.e. 45.60% (197/432) were having education up to primary level and 31.48% (136/432) respondents were illiterate. Illiteracy was found more among respondents from rural area (42.59%). [Table 1]

Table 2 describes the knowledge regarding mosquito borne diseases transmission. Total 380 (87.96%) respondents knew that mosquito transmits malaria. Regarding other diseases like dengue, chikunguniya and filaria, 79 (18.29%), 160 (37.04%) and 22 (5.09%) respectively knew that they are transmitted by mosquito. In general knowledge regarding various diseases transmitted by mosquitoes was higher in urban respondents than in rural respondents. And the difference was found to be statistically significant for every disease.

Table 1: Age and Education wise distribution of respondents

	Urban areas N (%)	Rural areas N (%)	Total N (%)
Age group (in years)			
21-30	113 (52.31)	99 (45.83)	212 (49.07)
31-40	61 (28.24)	65 (30.09)	126 (29.17)
41-50	31 (14.35)	32 (14.81)	63 (14.58)
51-60	8 (3.70)	13 (6.02)	21 (4.86)
≥ 61	3 (1.39)	7 (3.24)	10 (2.31)
Total	216 (100)	216 (100)	432 (100)
Mean (95% CI)	32.83 (31.54 - 34.12)	35.18 (33.73 - 36.64)	34 (33.03 - 34.99)
SD	±9.67	±10.88	±10.35
Educational status			
Illiterate	44 (20.37)	92 (42.59)	136 (31.48)
Primary	95 (43.98)	102 (47.22)	197 (45.60)
Secondary	45 (20.83)	13 (6.02)	58 (13.43)
Higher secondary	24 (11.11)	7 (3.24)	31 (7.18)
Graduate	7 (3.24)	2 (0.93)	9 (2.08)
Post graduate	1 (0.46)	0 (0.00)	1 (0.23)
Total	216 (100)	216 (100)	432 (100)

Table 2: Knowledge of respondents regarding mosquito borne diseases transmission

Disease	Urban areas N (%)	Rural areas N (%)	Total N (%)	p
Malaria	204 (94.44)	176 (81.48)	380 (87.96)	<0.001
Dengue	52 (24.07)	27 (12.50)	79 (18.29)	< 0.01
Chikun guniya	109 (50.46)	51 (23.61)	160 (37.04)	< 0.001
Filaria	21 (9.72)	1 (0.46)	22 (5.09)	< 0.001
Other	13 (6.02)	12 (5.56)	25 (5.79)	
Don't know	11 (5.09)	35 (16.20)	46 (10.65)	

Table 3: Knowledge of respondents regarding mosquito borne diseases symptoms and mosquito breeding places

	Urban areas N (%)	Rural areas N (%)	Total N (%)
Symptoms of Malaria*			
Fever	206 (95.37)	207 (95.83)	413 (95.60)
Chills	165 (76.38)	142 (65.74)	307 (71.06)
Headache	84 (38.89)	75 (34.72)	159 (36.81)
Vomiting	65 (30.09)	37 (17.13)	102 (23.61)
Rigors	54 (25.00)	17 (7.87)	71 (16.44)
Nausea	9 (4.17)	2 (0.93)	11 (2.55)
Don't know	10 (4.63)	7 (3.24)	17 (3.94)
Symptoms of Dengue*			
Fever	32 (14.81)	18 (8.33)	50 (11.57)
Joint pain	26 (12.04)	5 (2.31)	31 (7.18)
Muscle pain	14 (6.48)	0 (0.00)	14 (3.24)
Severe headache	8 (3.70)	1 (0.46)	9 (2.08)
Chills	2 (0.93)	3 (1.39)	5 (1.57)
Don't know	177 (81.94)	193 (89.35)	370 (85.65)
Symptoms of Chikunguniya*			
Joint pain	133 (61.57)	78 (36.11)	211 (48.84)
Fever	103 (47.69)	59 (27.31)	162 (37.50)
Joint swelling	76 (35.19)	28 (12.96)	104 (24.07)
Vomiting	3 (1.39)	3 (1.39)	6 (1.39)
Anorexia	5 (2.31)	0 (0.00)	5 (1.16)
Chills	1 (0.46)	0 (0.00)	1 (0.23)
Don't know	60 (27.78)	128 (59.26)	188 (43.52)

*Multiple answers allowed

Knowledge regarding various symptoms of mosquito borne diseases is shown in Table 3. Most of the respondents had knowledge of fever (95.60%) and chills (71.06%) as common malaria symptoms. While 71 (16.44%), 159 (36.81%), 11 (2.55%), 102 (23.61%) respondents had knowledge of rigors,

headache, nausea and vomiting as symptoms of malaria respectively. Almost 4% respondents had no knowledge regarding symptoms of malaria. Over 85% of the respondents did not know about dengue symptoms. Among those who had some knowledge responded fever (11.57%) and joint pain (7.18%) as common dengue symptoms. Regarding symptoms of chikunguniya, 211 (48.84%) told joint pain. Fever was told by 162 (37.50%) respondents and joint swelling was told by 104 (24.07%) respondents. 59% respondents of rural areas and 28% respondents of urban areas did not know about symptoms of chikunguniya.

Table 4: Knowledge of respondents regarding mosquito breeding places

Breeding places *	Urban areas N (%)	Rural areas N (%)	Total N (%)
Water collection	202(93.52)	187 (86.57)	389 (90.05)
Ditches	141(65.28)	86 (39.81)	227 (52.55)
Vehicle tyres	46 (21.30)	31 (14.35)	77 (17.82)
Broken bottles	24 (11.11)	8 (3.70)	32 (7.41)
Coconut shells	7 (3.24)	3 (1.39)	10 (2.31)
Others	20 (9.26)	29 (13.43)	49 (11.34)
Don't know	10 (4.63)	17 (7.87)	27 (6.25)

*Multiple answers allowed

Table 5: Knowledge of respondents regarding mosquito borne disease prevention

Prevention methods*	Urban areas N (%)	Rural areas N (%)	Total N (%)
Personal protection	208 (96.30)	183 (84.72)	391 (90.51)
Don't allow water collection in surroundings	105 (48.61)	38 (17.59)	143 (33.10)
Fogging	9 (4.17)	24 (11.11)	33 (7.64)
Insecticidal spraying	13 (6.02)	12 (5.56)	25 (5.79)
larvivorous fishes	0 (0.00)	0 (0.00)	0 (0.00)
Others	6 (2.78)	17 (7.87)	23 (5.32)
Don't know	2 (0.93)	14 (6.48)	16 (3.70)

*Multiple answers allowed

Table 4 depicts knowledge regarding mosquito breeding places. Water collection was widely accepted as mosquito breeding place (90.05%). 227 (52.55%) respondents told ditches as mosquito

breeding place. Vehicle tyres, broken bottles and coconut shell were told by 77 (17.82%), 32 (7.41%) and 10 (2.31%) respectively. And 27 (6.25%) respondents did not know about mosquito breeding places. In general respondents of urban areas had good knowledge than respondents of rural areas.

As shown in Table 5, nearly 90% i.e. 391 respondents knew that mosquito borne diseases can be prevented by using personal protective measures against mosquito bites. 143 (33.10%) respondents

Table 6: Preventive measures for mosquito borne disease taken by family

Preventive measures taken	Urban areas N (%)	Rural areas N (%)	Total N (%)	P value
Use of liquid repellent vaporizer	163 (75.46)	63 (29.17)	226 (52.31)	<0.01
Use of mosquito net	20 (9.26)	47 (21.76)	67 (15.51)	<0.05
Screening of windows	32 (14.81)	5 (2.31)	37 (8.56)	<0.01
Use of repellent cream	0 (0.00)	3 (1.39)	3 (0.69)	-----
Use of mosquito coils and mats	25 (11.57)	33 (15.28)	58 (13.43)	-----
None	19 (8.80)	84 (38.89)	103 (23.84)	<0.01

knew that by not allowing water collection in surroundings can prevent mosquito borne diseases. None of the respondents knew that using larvivorous fishes can prevent mosquito borne diseases. Overall knowledge regarding prevention of mosquito borne diseases was more in urban respondents than in rural respondents.

Table 6 depicts the various measures used by family for prevention of mosquito bites. Total 226 (52.31%) respondents were using liquid repellent vaporizer and 67 (15.51%) respondents were using mosquito net. Mosquito coils and mats were used by 58 (13.43%) respondents. In urban areas, most of the respondents i.e. 163 (75.46%) were using liquid repellent vaporizer while in rural areas, vaporizer was used by only 29% respondents and the difference was statistically significant (p value < 0.01). But, 47 (21.76%) families in rural areas used mosquito nets while in urban areas use of mosquito net was less (9.26%) and the difference was statistically significant (p value < 0.05). 84 (38.89%) respondents of rural areas were not using anything

for personal protection against mosquito bite. The difference between urban and rural areas regarding any personal protective measures taken against none taken was found statistically significant (p value < 0.001).

DISCUSSION

The mean (SD) age of respondents was 34 (10.35) years in present study. A similar study done by Unnikrishnan B et al [11], (2008), in Coastal South India, mean (SD) age of the respondents was 34.6 yr (12.2) years. In our study 31.48% respondents were illiterate which is far less than that found in study by MuninarayanaC et al [10], (2008); in Koral district (68.67%). Kinung'hi SM et al [12], (2010), in North-western Tanzania had done a study in which almost quarter (23.6%) respondents were illiterate.

Malaria was perceived most common disease transmitted by mosquitoes in our study (87.96%) which is better than other studies [13 – 16]; but regarding other mosquito borne diseases like dengue (18.29%), chikunguniya (37.04%) and filaria (5.09%) knowledge is not up to the mark and other studies had far better result than our study [17,18,19, 20].

In our study fever was the most common symptom of malaria told by respondents (95.60%) followed by chills (71.06%). These results are far better than other studies [4, 12, 13] [21]. Over 85% of respondents had no knowledge regarding symptoms of dengue. Fever as a symptom of dengue was told by 11.57% respondents in our study which is quite less than other studies [17, 18, 20, 23]. In our study muscular pain was told by 3.24% respondents which is better than study by Koenraad et al (1%) [23]; but far less than study by Naing et al (71.8%) [22] and ItratA et al (21.8%) [17].

Regarding knowledge about mosquito breeding places, majority of the respondents associated water collection with breeding place (90.05%), which is much higher than the study done by MattaS et al (45%) [13]. In present study 52.55% respondents told ditches as mosquito breeding place, this is quite comparable to study done by Boratne et al(34.95%) [1].

This study reveals that most of the respondents (90.51%) had knowledge that mosquito borne diseases can be prevented by taking personal protective measures. This includes using mosquito nets, repellents, mats vaporizers and coils. In study of ItratA et al, 50.1% told to use mat/coil/liquid

vaporizer for prevention of malaria [17]. In our study, only 5.79% respondents told insecticidal spraying for prevention of malaria, this is quite less than other studies [17, 21].

Regarding practice, most of the respondents used liquid repellent vaporizer (52.31%), which is much higher than found in study by Yadav SP et al (4%) [6], Nalongsack S et al (2%) [18]; but lower than study by Patel AB et al (61%) [4]. Mosquito nets were used by 15.51% respondents, which is quite lower than found in other studies [6, 13, 18]; but higher than study by Itrat A et al (1.9%) [17] and Patel AB et al (10%) [4].

Overall knowledge regarding malaria was satisfactory while knowledge regarding other mosquito borne diseases was poor. Knowledge regarding prevention of mosquito borne diseases was good but still so many households lacks practice. Overall knowledge regarding prevention was found more in urban respondents than in rural respondents. So it is recommended that community should be encouraged to take necessary actions at household level to prevent mosquito borne diseases and the treating doctors and physicians should be encouraged to give health education to the patient about the appropriate and affordable preventive measures.

CONCLUSION

Knowledge regarding malaria was found satisfactory but knowledge regarding other mosquito borne diseases was unsatisfactory. Knowledge regarding prevention of mosquito borne disease was good and majority of the households were using preventive measures against mosquito bites.

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