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Original Research Article

A study on community perception and risk reduction practices for dengue and malaria in field practice area of RHTC of JNUIMSRC, Jaipur- A cross-sectional study

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ABSTRACT

Introduction: Globally, Vector Borne Diseases (VBDs) account for 17% of infectious disease burden. Among VBDs, malaria and dengue are major public health problems due to their endemic nature and at times presenting outbreaks, and socioeconomic effects of them. A recent estimate indicates 390 million dengue infections per year, of which 96 manifest clinically with any severity of disease. The number of reported cases have increased from 2.2 million in 2010 to 3.2 million in 2015. India, being the highest burden country in South East Asian region, showed a declining trend in malaria incidence in recent years and is now poised to continue its stride toward achieving malaria elimination target by 2030.

Materials and Methods: From November 2019 to February 2020. People residing in field practice area of RHTC, JNUIMSRC, village Sindoli Jaipur. The study was done by a pre-designed, pre-tested, semi-structured interview schedule.

Discussion: In present study 88.4% heard about Malaria and Dengue, 46.37% were knowing all symptoms of these diseases, 83.69% know that it is transmitted by mosquito bite and 79.71% knew that water is their breeding site. 82.24% knew that water clogging is major cause of breeding. 65.57% believed that they are at risk of these diseases. 80.07% believed that clearing of water containers weekly will prevent breeding, 44.92% believe control activities a joint responsibility and 55.43% believe that public health persons should be allowed to inspect and spray. 54.71% believe sleeping under net prevent from malaria and Dengue. 83.69% practice environmental cleanliness to prevent these diseases. 37.68% respondent were drying their coolers when it was empty after use. 87.31% were using covered overhead tanks. 61.95% used to through coconut shells, egg shells and empty containers and used household water in discriminately.

Conclusion: Rapid unplanned urbanization with the growth of substandard housing conditions, poor sanitation, and other anthropogenic environmental changes has made rural areas and urban slums more vulnerable to these diseases and unavailability of effective vaccines, resistance to anti-malarial and anti-dengue medicines has further worsen to the situation. For this problem public health experts require a deeper insights into existing community perceptions and practices and thereby helps in identifying the attributes that influence the community in adopting healthy practices and responsive behaviors, as regard Malaria and Dengue.

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1. Introduction

Globally, Vector Borne Diseases (VBDs) account for 17% of infectious disease burden.¹ Among VBDs, malaria and dengue are major public health problems due to their

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endemic nature and at times presenting outbreaks, and socioeconomic effects of them. In 2017, nearly half of the world's population was at risk of malaria with an estimated 219 million cases² whereas, Dengue, a neglected tropical disease is endemic in more than 100 countries with over two-fifths of world's population at risk.³ About 3.9 billion people in 128 countries are at risk of infection with dengue viruses. A recent estimate indicates 390 million dengue infections per year, of which 96 manifest clinically with any severity of disease. The number of reported cases have increased from 2.2 million in 2010 to 3.2 million in 2015. India, being the highest burden country in South East Asian region, showed a declining trend in malaria incidence in recent years and is now poised to continue its stride toward achieving malaria elimination target by 2030.⁴ The year 2016 was characterized by large dengue outbreaks worldwide. In 2015, Delhi, recorded its worst outbreak since 2006 with over 15,000 cases. According to the latest estimates, there were 216 million cases of malaria in 2016 with 445,000 deaths. Between year 2010 and 2016, malaria incidence among population at risk decreased by 18 per cent globally; during the same period malaria mortality rates among population at risk decreased by 32% about 91 per cent of malaria cases and 99 per cent of deaths due to malaria is reported from North-eastern states, Chhattisgarh Jharkhand, Madhya Pradesh, Odisha, Andhra Pradesh, Maharashtra, Gujarat, Rajasthan, West Bengal and Karnataka. The malaria incidence and deaths due to malaria have reduced significantly in recent years. Increase in number of *P. Falciparum* infection has increased the mortality caused by Malaria considerably, especially in eastern area of India. However, dengue is endemic in all 29 states and 6 UTs in India, and has witnessed a rapid increase in incidence over the past 50 years. Despite ongoing efforts and surveillance activities, West Bengal reported recurrent outbreaks in recent past and had maximum reported cases among all states in 2016.⁵ Thus India is facing a great public health problem in the form of Malaria and Dengue.

2. Objectives

1. To determine the socio-demographic profile of people living in the field practice area of RHTC, JNUIMSRC, village. Sindoli, Jaipur, Rajasthan, and
2. To determine the perception and risk reduction practices, attitude and knowledge of malaria and dengue among them.

3. Materials and Methods

3.1. Study design

Cross sectional study.

3.2. Study duration

From November 2019 to February 2020.

3.3. Study population

People residing in field practice area of RHTC, JNUIMSRC, village Sindoli Jaipur.

3.4. Sampling method

Purposive sampling method was followed.

3.5. Sample size calculation

A previous community based cross sectional study in Chetla, Kolkata, by Sahoo et al.^{6,7} reported that 97.9% of study participants had awareness that malaria is transmitted by mosquito followed by dengue (90.9%). The sample size was estimated based on the reported awareness on dengue (0.9) and considering confidence interval of 95% with $Z_{1-\alpha}=Z_{0.95}=1.96$ and absolute error (L) of 5%. As multistage sampling was done, a design effect of two was used to calculate the sample

$$\text{Sample size} = N = \frac{Z^2 p*(1-p)}{\epsilon^2}$$

Where, p : Prevalence rate of malaria & Dengue is around 90.9% in India ($p = 0.909$).

Z : Inverse normal probability = 1.96

ϵ : Margin of error, i.e. 0.05

By using the above formula, the sample is 138

Design effect, Sample size = $N \times 2 = 138 \times 2 = 276$.

3.6. Study tools

The study was done by a pre- designed, pre -tested, semi-structured interview schedule.

3.7. Inclusion criteria

Consenting adult family member (≥ 15 years) among residents (residing for >2 years) in selected field practice area were interviewed, preferably the head.

3.8. Exclusion criteria

Those who were not willing to participate in the study and were less than 15 and more than 60 years of age were excluded from present study. Besides those who could not be contacted in spite of two visits due to their engagement in other official / personal works, were also excluded from present study.

3.9. Ethical approval and consent

Study was carried out after taking due permission from Institutional Ethics Committee JNUIMSRC and after taking informed consent from participants.

Table 1: Socio-demographic distribution of respondents

	Variables	Numbers	Percentage
1. Gender	Male	184	66.66
	Female	92	33.33
2. Age Groups	15-25 yrs	27	9.78
	26-35 yrs	42	15.21
	36-45 yrs	61	22.10
	46-60 yrs.	46	16.66
3. Religion	Hindu	269	97.46
	Muslim	07	02.53
	Others	00	00
4. Education	Illiterate	121	43.85
	Primary	77	27.89
	Middle	51	18.47
	Hr Sec and above	27	09.78
5. Occupation	Farmer	221	80.07
	Service	39	14.13
	Business	16	05.79
6. Housing	Pucca	76	27.53
	Semi-pucca	151	54.71
	Katcha	49	17.75
7. Socio-economic status	BPL	39	14.13
	Others	237	85.86

Table 2: Distribution of knowledge of respondents about dengue and malaria

	Variables	Numbers	Percentage
1. Heard about Disease	Yes	243	88.04
	No.	33	11.95
2. Symptom of Dis.	Fever with chills, rigor	107	38.76
	Headache / Bodyache	27	09.78
	Vomiting, Diarrhoea	14	05.07
	All of above	128	46.37
3. How Dis. transmits	By mosquito bite	231	83.69
	Ingestion of contaminated food, and water	30	10.86
	Polluted air	11	03.98
4. Where mosquito breed.	Direct contact	4	01.44
	Water	220	79.71
	Soil	9	03.26
	Garbage	21	07.60
	Plants	7	02.53
5. Can you identify mosquito responsible	Do not know	19	06.88
	Yes	21	07.60
6. Is water logging is major cause of breeding	No	255	92.39
	Yes	227	82.24
	No	11	03.98
	Do not know	38	13.76

Table 3: Distribution of attitude of respondent about dengue and malaria

	Variables	Numbers	Percentage
1. Do you think you are at risk of Disease	Yes	181	65.57
	No	31	11.23
	Do not know.	64	23.18
2. Do you think clearing water container weekly prevent breeding	Yes	221	80.07
	No	13	04.71
	Do not know	42	15.21
	Individual / Family	86	31.15
3. Who you think responsible for control activities of Disease	Community.	44	15.94
	Local administration	8	02.89
	Municipality/ Nigam	14	05.07
	All of above	124	44.92
4. Should Public Health Personnel be allowed to spray and inspect for vector control	Yes	153	55.43
	No	70	25.36
	Do not know.	53	19.20
5. Do you think sleeping under net prevents Disease	Yes	151	54.71
	No	58	21.01
	Do not know	67	24.27
6. Do you think to visit health institution when suffering from high fever	Yes	221	80.07
	No	41	14.85
	Do not know	14	05.07

Table 4: Distribution of practices of respondents about dengue and malaria

	Variables	Numbers	Percentage
1. Environment cleaning can prevent Dis.	Yes	231	83.69
	No	7	02.53
	Do not know	38	13.76
	Every 3 rd day	35	12.68
2. How often you dry coolers and containers of water.	Every 7 th day	57	20.60
	Every 14 th day	81	29.04
	When empty after use	104	37.68
	Using bed nets	101	36.59
3. What preventive measure using	Using repellants/coils/liquids	26	09.42
	Wearing protective cloths	49	17.77
	Using window, door screening	11	03.98
	Using chemoprophylaxis	00	00
4. Overhead tank	Nothing	89	32.24
	Covered	241	87.31
5. How you dispose coconut shell, egg shell, empty containers, tiers etc	Uncovered	35	12.68
	Indiscriminate out side house	171	61.95
	On the roof	36	13.04
6. How you dispose your used water	Personnel or public dustbin	69	25.00
	Outside open drain	211	76.44
	Septic tank	19	06.88
	Street drains	46	16.68

4. Discussion

As depicted in Table 1. In the present study 66.66% were male participants and 33.33% were female participants in our study. From age group 15-25 years 9.78%, from age group 26-35 years 15.21%, from age group 36 – 45 years 22.10% and from age group 46-60 years 16.66% were the participants in present study. Among study group 97.46% were Hindu and 02.54% were Muslims by religion. As regard education status of participants, 43.84% were illiterate, 27.89% up to primary educated, 18.47% up to middle educated and 09.78% were up to secondary and above educated. In this study as regard their occupation 80.07% were farmers, 14.13% were engaged in some government or private service and 05.79% were doing business. 27.53% participants were residing in Pacca houses, 54.71% were residing in semi-pacca houses and 17.75% were residing in kacha houses in present study. 14.13% of participants were from BPL class in present study.

As Table 2 depicts, while assessing the knowledge of participants it was found that 85.87% of participants heard about Malaria and Dengue while 14.13% participants did not heard about these diseases. In study of Debayan et al⁸ all respondent were aware of the disease. In a study by Charu Kohli et al⁹ 65.1% of respondent were knowing about Malaria and 62.3% respondent about Dengue. in Delhi. 38.76% of participant were knowing fever with chills and rigor, 09.78% knew Headache / Body ache, 05.07% knew Vomiting-Diarrhea as a symptom of these diseases and 46.37% of participants knew that all of the above were the symptoms of these diseases in our present study. Vikas et al¹⁰ in their study found that 75% of participant were knowing symptoms of these diseases. Debayan et al. reported that 80.2% of respondent knew fever as a symptom of these diseases. 28.1% of respondent in study of Charu Kohli et al, at Delhi were knowing about all symptoms of Malaria and Dengue. As regard transmission of disease 83.69% participants know that it is transmitted by mosquito bite, 03.98% were of opinion that it is transmitted by polluted air, 10.86% were of opinion that it is transmitted by ingestion of infected food and water and direct contact was attributed by 01.44% of participant as a cause of transmission in present study in a study by Yerpude PN et al¹¹ from Andhra Pradesh, India found in his study that 70.09% of study population had awareness that mosquito bite is the cause for malaria but only 33.72% of the study population knew that Dengue, was transmitted by mosquito. Pandit N et al¹² of Vadodara, Gujarat, in his study found that almost 71% of study population had awareness that mosquito bite is the cause for malaria but only 39% of the study population knew that dengue, is transmitted by mosquito.¹² Vikas et al. in their KAP study found more than 90% were knowing that it is transmitted by mosquito bite, so over all knowledge of transmission was good of Malaria

as compared to Dengue which was lagging behind in IEC. As regard breeding site of mosquito, 79.71% know water as site, 07.60% Garbage as site, 03.26% soil as site and 02.53% Plants as a site for breeding and 06.88% do not know about the site of breeding of mosquito in present study. Similar were the observations in a study by Yerpude PN et al. from Andhra Pradesh, that 91.50% of the study participants had awareness about breeding places of mosquito. 22.29% of study population still had myths that garbage was the breeding place for mosquito. Pandit N et al. in his study in Vadodara showed that 98.7% of the study participants had awareness about breeding places of mosquito. Boratne AV et al.¹³ in his study in Puducherry found that 59.79% male and 61.06% female respondents knew that stagnant water was the breeding place for vectors followed by ditches and ponds in the vicinity. In a study by Mayur V et al.¹⁴ among people of urban and rural areas of Rajkot district found that water collection was widely accepted as mosquito breeding place (90.05%), among them around (52.55%) respondents told ditches as mosquito breeding place and (6.25%) respondents did not know about mosquito breeding places. Anand T et al.¹⁵ in his study conducted in a resettlement colony of central Delhi found that majority of the participants (68%) knew about the breeding site of anopheles and Dengue mosquito. 92.39% of participants were not able to identify the mosquito responsible for these diseases, only 07.60% of participant could identify mosquito responsible for transmission of these diseases in present study. In the study of Debayan Poddar et al 7.3% could identify vector of malaria and 23.3% of respondent could identify vector of Dengue. Collection of water as a site for breeding of mosquito was a well-known feature in our study. 82.24% of participants held water logging as a cause of mosquito breeding while 03.98% were not of this opinion and 13.76% said they do not know about this in present study but in Debayan Poddar study 34% of respondent regarded water logging as a cause of these diseases. In study of Charu Kohli et al at Delhi 49.7% of respondent knew that prevention of stagnation of water will prevent Malaria and Dengue.

As depicted in Table 3, while assessing attitude of participant, it was found that 65.57% of participant thought that they were at risk of these diseases while 11.23% thought no risk of these diseases and 23.18% were having no opinion on inquiring. Similar were the observation of Debayan who reported that 67.7% of participant felt that they are at risk of these diseases. 80.07% participant thought that clearing water container weekly will prevent breeding of mosquitos. 04.72% participants thought no while 15.21% participants were having no idea about it in present study. While assessing responsibility of control activities of these diseases, 31.15% thought individual / family is responsible, 15.94% participant thought community is responsible, 02.89% thought local administration is responsible, 05.07% thought municipality / nigam is responsible and 44.92%

thought all of above are to be responsible in present study. Debayan et al. in their study reported that 25.3% respondent think that vector control is the responsibilities of municipality. Should Public health personnel be allowed to inspect and spray houses, 55.44% were of in opinion yes, 25.36% were of in opinion no and 19.20% had no opinion about it in our study. 54.72% participant thought sleeping under net will prevent these diseases, 21.01% participant thought no it will not prevent occurrence of these diseases, 24.27% do not have any opinion about this, in our study. 80.08% participants thought to visit health institution while suffering from high fever, 14.85% of participant thought no need to go to health institution and relied upon traditional household remedies like consuming lemon water, kadha of Tulsi, black paper etc or simply cold sponging. 05.07% participants had no opinion about this, in our study.

As depicted in Table 4. Assessing the practice, 83.69% of participants were of opinion that cleaning of environment will prevent occurrence of Dengue Malaria, 02.54% have negative opinion while 13.76% have no idea about it among respondents. 12.68% were drying coolers and containers of water every 3rd day, 20.60% every 7th day, 29.04% every 14th day and 37.68% participants were drying only when it was empty after use in present study. On inquiring about use of protective measures 36.59% of participants were using bed nets, 09.42% were using repellents, coils or liquids, 17.77% were using protective clothing covering body, 03.98% of participants relied on screening of doors and windows and 32.24% used no preventive measure for prevention of Dengue and Malaria. In Dabayan study 7% respondent were using door –window screening for protection from mosquito and 53.8% were using mosquito repellents. 87.31% participants were using covered overhead tanks whereas 12.69% were using uncovered overhead tanks for their routine use in our study. In study of Charu Kohli et al at Delhi 41.1% of respondent were aware that covering of water containers will prevent Malaria and Dengue. On inquiring about disposal of coconut shells, eggs shells, empty containers and tiers etc 61.95% participants were throwing indiscreetly outside house, 13.05% were throwing on roof creating sites for breeding of mosquitos and 25% were using personal or public dustbins for disposal in present study. 76.44% of participants disposed their household used water outside in open drains, 06.88% participants used septic tank for disposal and 16.68% used street drains for disposal of used water in our study, showing their irresponsible behavior in this respect.

5. Conclusion

Rapid unplanned urbanization with the growth of substandard housing conditions, poor sanitation, and other anthropogenic environmental changes has made rural areas and urban slums more vulnerable to these diseases

and unavailability of effective vaccines, resistance to anti-malarial and anti-dengue medicines has further worsen to the situation. Poor health education and poverty have further added to it. For tackling the situation community involvement and ownership are crucial for success and sustainability of VBD control program. For that we require to know local community perspectives and to identify the gaps and design culturally appropriate, effective malaria and dengue prevention, and control strategies looking to local situation. For this problem public health experts require a deeper insights into existing community perceptions and practices and thereby helps in identifying the attributes that influence the community in adopting healthy practices and responsive behaviors, as regard Malaria and Dengue.

6. Source of Funding

None.

7. Conflict of Interest

The authors declare no conflict of interest.

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