



Original Article

Knowledge, Attitude and Practices on Prevention of Dengue Fever among Various Groups of People of Urban Tiruchirappalli

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Back ground: Dengue fever is a major public health problem in India and throughout the tropical and subtropical regions of the world. More than 70% of the world's population are at risk for dengue. Tiruchirappalli is a city located in the middle of the state Tamilnadu, south India. It is one of the dengue endemic areas with intermittent outbreaks. The knowledge levels of general public about Dengue fever, modes of spread and prevention was not measured and research done about it at Tiruchirappalli were limited. Various awareness campaigns had been conducted in the past, regarding Dengue fever and its transmission. This study was planned to measure the knowledge about Dengue fever, attitude and practices about its prevention. **Objectives:** To assess the knowledge about Dengue fever, attitude and practices on Dengue prevention among various groups of people at Tiruchirappalli urban area. **Experimental approach:** A cross sectional study was conducted from December 2016- May 2017 in four Zones of Tiruchirappalli Corporation. The study had four groups of participants which included women aged between 25 to 50 years, men aged between 25 to 50 years, college students between 18 to 25 years and school students between 11 to 18 years. The city had four administrative Zones. From each Zone 100 participants were selected randomly and totally 400 participated. The data was analysed on SPSS version 18. **Findings and Discussion:** The mean knowledge score of school students were 3.02 followed by men 2.41, women 2.27 and college students 1.40 respectively. The school students had the highest mean knowledge score on *Aedes* larva breeding sites which was statistically significant than college students and women with p value <0.001 and 0.010 respectively. The college students had the less knowledge score than other groups with p values <0.001, 0.002, <0.001 and was statistically significant. **Conclusion:** The school students had more knowledge on *Aedes* larva breeding sources than other groups.

Key words:

Aedes, Attitude, Dengue, Knowledge, Practice.

1. INTRODUCTION

Dengue fever is a major public health problem in India and throughout the tropical and subtropical regions of the world. Almost 50% the world's population are living in dengue endemic countries.¹ More than 70% of the world's population are at risk for dengue especially South East Asia

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Region (SEAR) and Western Pacific Region, where 75% of the current global disease burden of dengue exists.² Dengue virus was isolated for the first time in India during 1945 and the first dengue fever in India was reported in Vellore district in Tamil Nadu during the year 1956. The first major Dengue Haemorrhagic Fever (DHF) outbreak occurred in India at Calcutta (West Bengal) in the year 1963^{3,4}. Dengue Fever (DF) along with its two clinical syndromes, Dengue Haemorrhagic fever (DHF) and Dengue Shock Syndrome (DSS) are the most important arboviral diseases of human being and it is an important infectious disease in both the tropical and subtropical regions.⁵ In South India, all the four serotypes of dengue viruses have been isolated from clinical specimens and also in mosquitoes in Vellore, Tamil Nadu during early 1960s establishing the activity of different serotypes of dengue in this area.^{6,7} In Tiruchirappalli the first dengue outbreak occurred during the year 2003.⁸ From 2003 onwards dengue cases were being reported and it is an endemic area for dengue fever. The mean numbers of cases from the year 2013 to 2016 were 220 cases per year. The knowledge levels of general public about Dengue fever, modes of spread and prevention was not measured and research done about it at Tiruchirappalli were limited. Various awareness campaigns had been conducted in the past regarding Dengue fever and its transmission. This study was planned to measure the knowledge about Dengue fever, attitude and practices about its prevention. The objective of the study was to assess the knowledge about Dengue fever, attitude and practices on Dengue prevention among various groups of people in Tiruchirappalli urban area.

2. MATERIALS AND METHODS

This cross sectional study was conducted from December 2016 to May 2017 at Tiruchirappalli urban area. Assuming 50% knowledge among general public about Dengue, the sample size was arrived at 400 people with 5% precision with formula $4PQ/d^2$. Adults and children between the age groups of 11 to 50 years were included in the study. The physically handicapped individuals who had speech and hearing disabilities were excluded from the study. The study population consisted of four groups which were school students between 11 to less than 18 years, college students between 18 to less than 25 years, men between 25 to 50 years and women between 25 to 50 years of age respectively. Tiruchirappalli urban area has four administrative Zones namely Abishekapuram, Ponmalai, Srirangam and Ariyamangalam respectively. One school, one college and one ward (Corporation administrative units) were chosen from each Zone by stratified random sampling. Thus four schools, four colleges and four wards were chosen in total. From each school 25 students were chosen randomly and the questionnaire was administered. Similarly from each college 25 students were chosen randomly and questionnaire was administered. 25 men were chosen by systematic random sampling by visiting every 3rd shop/office in a

commercial area and 25 women were chosen randomly by systematic random sampling by visiting every 3rd house in a randomly chosen residential area. Thus each Zone had 100 participants and four Zones totalled to 400 participants. Participants were informed about the study and informed consent was obtained. A structured, pretested and self administered questionnaire was used. It tested the knowledge about Dengue fever, attitude and dengue preventive practices. The data was entered in EpiData 3.0 software and analysed on SPSS version 18. Descriptive analysis, proportions for each variable and comparison between groups by students for using chi-square 't' test. This study was approved by the Institutional ethical committee I.E.C. NO. 48/2016 Dated 23.11.2016.

3. RESULTS AND DISCUSSION

Among the 400 participants 45.8% were male and 54.3% were female. The age ranged from 11 to 50 years. Three percent of the participants had studied up to 5th standard, 49.8% of participants had studied from 6 to 10 standard, 3.3% of the participant had studied up to 11 to 12 standard. 43.3% of the participant had studied either degree or diploma. Only 0.8% of the participants were illiterate. Overall 8% of the resided in Kutcha house, 63.8% of them resided in Pucca house, 23% Residing in Semi Pucca and 5.3% lived in other type of houses. Around 56% of participants belong to upper middle income group, 15% lower middle income group, 28% belong to upper lower income group and 1% belong to lower income group according to modified Kuppasamy socio economic scale for Urban area 2016 (Table I).

About 80% of college students and 93% of school students, 76% of women and 72% of men knew dengue as one type of fever among all fevers (Table II). Among the study participants 80% college students, 89% of school students, 93% of women and 94.9% of men said that they knew about dengue fever. Dengue fever as a viral disease was known to 42% of college students, 39% of school students, 50% of women and 46% of men. The knowledge that the bite of the mosquito transmits dengue fever was known to 49% of college students, 53% of school students, 81% of the women and 76% of men. The knowledge about the name of the mosquito transmitting Dengue was known to 14% of college students, 59% of school students, 59% of women and 72% of men. Regarding the availability of treatment for Dengue fever 73% of college students, 74% of school students, 74% of women and 83% of men knew that there is specific treatment for Dengue fever and 16% of college students, 31% of school students, 64% of women and 55% of men knew that there is no vaccine available for prevention of Dengue fever.

The knowledge levels on *Aedes* larva breeding sites showed that 33%, 44%, 60% and 57% of college, school, women and men knew that *Aedes* larvae breeds in clean water respectively where as 45%, 34%, 5% and 7% said that *Aedes*

larva breeds in drainage (dirty) water. About 20% of college, 21% of school students, 34% of women and 32% of men knew that *Aedes* larva breeds in artificial containers having water. The knowledge on time of bite of *Aedes* mosquito was assessed and it was found that 77%, 74%, 59% and 65% of college, school students, women and men thought that *Aedes* mosquito bites at night time alone where as 23%, 6%, 2% and 2% of college, school students, women and men thought that *Aedes* mosquito bites during day time alone. 20% of school students, 39% of women and 33% men thought that *Aedes* mosquito bites both day and night times. The knowledge about prevention of Dengue mosquito breeding was assessed and 52% of college students thought fogging activities to be the best way to do it, whereas 60%, 72% and 81% on school students, women and men thought prevention of water stagnation around the house was the best way to do it (Table II).

The participants were asked to identify potential dengue breeding sites from a list of 9 items. Each rightly identified item had a score of one. Among the nine items two items had negative scoring. The final scores were calculated and was decided that those having a score of three and above had good knowledge on *Aedes* larva breeding sites. Among the college students 14% had scores three and above which was 53% in school students, 33% in women and 40% in men respectively. Among the four groups of participants the school students had good knowledge followed by men, women and college students. (Table II)

Out of 400 participants 335 (83.8%) obtained drinking water from corporation water supply, 35 (8.8%) from bore well, 12 (3%) from wells, 13 (3.3%) from plastic water containers and 2 (0.5%) from water lorries. (Table 3) Out of 400 respondents 378 (94.5%) of them store water, out of which 341 (90.2%) of them said that they closed their water storage containers with lids. In addition out of 378 people who stored water, 147 (38.9%) of them said that they cleaned their containers daily, 92 (24.3%) of them once in 3 days, 121 (32%) weekly, 12 (3.2%) clean once in a month, and 2 (0.5%) cleaned their container only during the next supply of water. (Table III)

All 400 participants were asked about the measures they adopt to prevent *Aedes* larval breeding and 55.8% of them said that they closed their water containers with lid, 32.5% of them cleaned their containers with bleaching powder, 10% of them observed dry day once a week and 1.8% of them did not take any measures. Regarding personal prophylactic measures out of 400 participants 52.3% of them used mosquito coils, 24.5% used creams, 23% used vaporizers, and other methods like window netting are 0.3%. Regarding environment favouring water stagnations, 68.5% of participants had piped line supply from corporation through pit taps on streets and 15.3% of participants received piped line supply through sumps. When queried about the responsibility of keeping the surroundings clean, out of 400 participants 92.3% believed it as the responsibility of the

concerned households, 6.8% believed it as the responsibility of the government and 0.8% believed it to be the responsibility of volunteers (Table IV)

The knowledge scores of the four groups of participants were compared. The maximum score was 7 and the minimum was zero. The mean score of school students was 3.02 followed by men 2.41, women 2.27 and college students 1.40 respectively. The school students had the highest mean knowledge score on *Aedes* larva breeding sites which was statistically significant on comparison of means by Bonferoni test than college students and women with p value <0.001 and 0.010 respectively (Table V). The college students had the less knowledge score than other groups with p values <0.001, 0.002, <0.001 and was statistically significant. The mean knowledge score of women and men were more than college students and statistically significant with p value of 0.002 and <0.001 respectively (Table V).

The knowledge about Dengue as a disease with fever as a symptom, a viral disease and mosquito being the transmitting agent was more among women, men and school students. These are similar to other studies done at Kuala during 2003⁹. Among the women participants in the present study, 81% knew that Dengue is a mosquito transmitted disease and 59% knew that *Aedes* mosquito transmits it. In a similar to a study done at Kanchipuram, Tamilnadu 89% of participants knew about it and the women's knowledge levels were unknown¹⁰. Regarding the knowledge on vaccine availability 55% of men and 64% of women knew that there is no vaccine for Dengue which is better than a similar study done at Sindh where only 45.7% knew about it¹¹. The college students harboured misconceptions like *Aedes* larva breeds in dirty/drainage water, *Aedes* mosquito bites at night time only than other groups. This could be because the health education programmes and other mass media activities would not have reached the college students. The mean knowledge score on *Aedes* larva breeding sites were more among school students followed by men, women and college students. This could be because that the urban area in which the study was done had Dengue outbreaks on the past and the schools had the health education programmes by district health authorities and the students were involved in source reduction activities. The women and men are better knowledgeable than college students on Dengue fever and this could be due to their age and exposure to mass media.

Though the knowledge is more the household environment seems to be conducive for *Aedes* larval breeding. The pit taps and sumps where most of the population (n=335, Table IV) receive water from piped supplies are potential water stagnation points. The water stagnation in public pit taps on streets are mostly not cleaned frequently and kept dry. The water is stored by 94.5% of the study participants which shows their interrupted water supply. Although 90.2% of them said that use lids to cover the water storage containers this study was not equipped to cross verify it and around 10% said that they don't use lids for water storage

containers. Cleaning the water containers entirely plays an important role in breaking the *Aedes* larva life cycle but only 39% of participants cleaned it daily, 24.3% cleaned it once in three days and 37% cleaned it less frequently. This could serve as a potential source of *Aedes* mosquitoes inside the household. All the participants said that they use personal protective measures like repellent creams, coils and vaporizers. There exists a favourable attitude towards the responsibility of keeping the surroundings clean as 92.3% of the participants said that it is the responsibility of concerned households. This attitude could be harboured to develop community participation in activities involving Dengue prevention.

Table 1: Socio Demographic Characteristics n=400 (n=number)

Gender	Male	183 (45.8%)
	Female	217 (54.3%)
Education level	Illiterate	3 (0.8%)
	Up to 5 th std	12 (3%)
	6 th to 10 th std	199 (49.8%)
	11 th to 12 th std	13 (3.3%)
	Degree/diploma	173 (43.3%)
Housing	Kutchra	32 (8%)
	Pucca	255 (63.8%)
	semi Pucca	92 (23%)
	Others	21 (5.3%)
Socio economic status	High income group	0
	Upper middle income group	223 (55.8%)
	Lower middle income group	60(15%)
	Upper lower income group	113 (28.3%)
	Lower income group	4(1%)

Table 2 : Knowledge about Dengue fever

	College students n=100	School students n=100	House wives aged 25 to 60 yrs n=100	Men aged 25 to 60 yrs n=100
Know Dengue as one of the various fevers	80(80%)	93(93%)	76(76%)	72(72%)
Said that they know about Dengue	80(80%)	89(89%)	93(93%)	94(94%)
Know that Dengue is due to a Virus	42 (42%)	39 (39%)	50 (50%)	46 (46%)
Know that mosquito bite transmit Dengue	49(49%)	53(53%)	81(81%)	76(76%)
Know the name of the mosquito	14 (14%)	59 (59%)	59 (59%)	72 (72%)
Know that specific treatment available for Dengue	73(73%)	74(74%)	74(74%)	83(83%)
Know that there is no vaccine for Dengue	16(16%)	31(31%)	64(64%)	55(55%)
Said that <i>Aedes</i> larva breeds in clean water	33 (33%)	44 (44%)	60 (60%)	57 (57%)
Said that <i>Aedes</i> larva breeds in drainage water	45%	34%	5%	7%
Said that <i>Aedes</i> mosquito breeds in artificial containers with water	20 (20%)	21 (21%)	34 (34%)	32 (32%)

Know that Dengue mosquito bites during day time	23%	6%	2%	2%	
Know that Dengue mosquito bites during Night time	77%	74%	59%	65%	
Know that Dengue mosquito bites during both day and night time	0%	20%	39%	33%	
Knowledge about prevention of Dengue Mosquito breeding	Fogging activities	52 (52%)	9 (9%)	7 (7%)	7 (7%)
	Source reduction activities	43 (43%)	15(15%)	0 (0)	1(1%)
	Applying larvicides in water	4 (4%)	16(16%)	21(21%)	11(11%)
	Preventing water stagnation around the house	1(1%)	60 (60%)	72 (72%)	81(81%)
Good knowledge (score of 3 and above on Dengue breeding sites identification)	14(14%)	53 (53%)	33 (33%)	40 (40%)	

Table 3: Water and its storage practices n=400(Number = n)

Source of drinking water (n=400)	Corporation	335 (83.8%)	
	Bore well	35 (8.8%)	
	Well water	12 (3%)	
	Lorry water	2(0.5%)	
	Can water	13 (3.3%)	
Water storage Practices (n=400)	others	3 (0.8%)	
	Present	378 (94.5%)	
	Absent	22 (5.5%)	
	Using Lid for water storage containers (n=378)	Yes	341 (90.2%)
		no	37 (9.8%)
Time interval of cleaning water containers (n=378)	Daily	147 (38.9%)	
	Once in three days	92 (24.3%)	
	Once in a week	121 (32%)	
	Once in a month	12 (3.2%)	
	During next water supply unknown	2 (0.5%) 4 (1.1%)	
Measures adopted to prevent Dengue larval breeding n=400	Closing containers with tight lid	223 (55.8%)	
	Cleaning with bleaching powder	130 (32.5%)	
	Observe dry day once a week	40 (10%)	
	No measures taken	7(1.8%)	
Personal protective measures n=400	Creams	98 (24.5%)	
	Coils	209 (52.3%)	
	Vaporizers	92 (23%)	
	others	1(0.3%)	

Table 4: Environment favoring water stagnation n=335*

Piped supply through pit taps	274 (68.5%)
Piped supply through sumps	61 (15.3%)
Attitude towards clean surroundings n=400	
The responsibility lies with Government	27 (6.8%)
Concerned	369 (92.3%)

households	3 (0.8%)
Volunteers	
Others	1 (0.3%)
*Those who do not have water source at homes	

Table 5: Comparison of knowledge scores on Aedes larva breeding sources

Groups	In comparison with	Mean difference	P value
School students 3.02 (1.94)	College students	1.620	<0.001*
	House wives	0.750	0.010*
	Men	0.610	0.062
College students 1.40 (1.33)	School students	-1.620	<0.001*
	House wives	-0.870	0.002*
	Men	-1.010	<0.001*
Housewives 2.27 (1.66)	College students	0.870	0.002*
	School students	-0.750	0.010*
	Men	-0.140	1.000
Men 2.41 (1.68)	College students	1.010	<0.001*
	School students	-0.610	0.062
	Housewives	0.140	1.000

*Statistically significant

4. CONCLUSION

The knowledge about Dengue fever was good among school students, women and men than college students. Attitudes towards to keeping their surroundings also good, however it was found that the good knowledge and attitudes does not necessarily lead to good practice. Health education programme should be continued and intensified with emphasis on college students and young adults.

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