

A Study on Awareness and Practice of Dengue Control Measures Among the Rural Population Residing in Field Practicing Area of Chengalpattu Medical College

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Abstract

Introduction: Dengue is identified as public health problem due to its rapid spread throughout the world. The key to controlling Dengue rests not only on the services offered by health officials but also on community awareness of preventive measures and their behaviour while seeking out health care.

Objective: To assess the awareness and practice of Dengue control measures among the rural population residing in field practicing area of Chengalpattu Medical College and to explore the factors influencing awareness and practice among the study population.

Methodology: A community based cross sectional study was conducted among 165 participants selected by Simple Random Sampling method from Manampathi block during November 2022. 18 years and above who were willing to participate were included. Semi-structured Questionnaire administered to the participants to assess socio-demographic details, awareness and practices. Data was collected and entered in Microsoft Excel and analyzed using SPSS version 25.

Results: In this study mean age was 40 years \pm 11.276. 61.2% participants had adequate awareness and 35.2% had good practices. A statistically significant association found between age group (<40years, $p=0.019$), gender (male, $p=0.03$), educational status(literate, $p=0.032$) and occupation(working participants, $p=0.015$) with awareness. Among the participants who had good practices 79.3% had adequate awareness about Dengue ($p=0.001$).

Conclusion: Gaps in awareness and practices found in this study. So regular awareness activities, such as health education campaigns and home visits to inform people about the mode of transmission and preventive measures needed to fill this gaps.

Keywords: Dengue, Awareness, Practices.

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Introduction

Dengue is a mosquito borne viral infection caused by *A. aegypti* found in tropical and subtropical regions of the globe and now continuously spreading all over the world[1]. Dengue fever is transmitted by the bite of female mosquito caused by human viral pathogen that belongs to the genus *Flavivirus* of the family *Flaviviridae* (single-strand, non-segmented RNA viruses) which is closely similar to West Nile virus[2]. The dengue virus is divided into four serotypes (DEN-1, DEN-2, DEN-3, and DEN-4). In the years 1779–1780, the first cases of epidemics of DF were documented from Asia, Africa, and North America[3]. The existence of these viruses and their mosquito carriers in the tropics are shown by outbreaks on all three continents. Soon after World War II, a pandemic condition was adopted in Southeast Asia and since then, it has spread around the world[4]. There are estimates that the dengue virus disease is widespread over the entire tropical belt in more than 100 nations, with an estimated 2.5 billion people at risk of contracting it. According to the WHO, 50 to 390 million people are become infected each year[5] with around 25000 deaths, mostly children[6].

In India, the first epidemic of clinical dengue-like illness was recorded in Madras (now Chennai) in 1780 and the first virologically proved epidemic of dengue fever (DF) occurred in Calcutta (now Kolkata) and Eastern Coast of India in 1963-1964[7]. Simultaneously it also involved the southern part of the country and gradually the whole country was involved with wide spread epidemics followed by endemic/ hyperendemic prevalence of all the four serotypes of DV. The epidemiology of dengue virus and its prevalent serotypes has been ever changing. Rainfall critically influences several crucial issues of people. Many towns and cities in Tamil Nadu are dependent on rivers for drinking water and

deficit in rainfall reduces drinking water supply. Due to this problem people are forced to store water in open containers. An important, but indirect effect of this seems to be proliferation of *A. aegypti*, the vector spreading dengue[8]. There are three main forms of dengue disease, the 1st one is dengue fever 2nd one the more severe dengue hemorrhagic fever (DHF) and 3rd ones Dengue Shock Syndrome (DSS)[9].

According to National Vector Borne Disease Control Program (NVBDCP), this year India has reported more than 110,473 dengue cases with 86 deaths[10]. There has been rapid geographical expansion of the virus and the vector, regular epidemics and increasing occurrence of Dengue Haemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) in India in recent years. The most common symptom of dengue is fever with any of the following: Nausea, vomiting, rash, aches and pains (eye pain, typically behind the eyes, muscle, joint, or bone pain)[11].

Lack of public knowledge, growing urbanisation, a rise in mosquito population brought on by deteriorating public health facilities, and shifting climatic circumstances have all contributed to an increase in dengue cases[12]. The best way to control Dengue in India is by vector control because there is no vaccine for the disease.

Vector control methods can be successful only if there is community participation and for the success of community based programmes, it is important to assess the community's perception regarding the disease, its mode of transmission and breeding sites[13]. It is also well established that lifestyle choices have a significant impact on the ecology and epidemiology of dengue, emphasising the importance of evaluating public perceptions of dengue in integrated vector management strategy.

Awareness of the community regarding Dengue and its prevention is inadequate according to a study conducted by T et al., in Coimbatore[14]. There exists a gap between the awareness acquired and the application of awareness into practices to prevent Dengue.

Thus, awareness of the community about the causes, mode of transmission, signs and symptoms and preventive measures of Dengue is of utmost importance. Although various steps have been taken by the Government and Non-Governmental Organizations to increase awareness about Dengue, very few studies have been done in rural areas to determine the impact of such interventions.

Thus, assessment of awareness and practices of the community would play a very important role in guiding public administrators to plan, design and implement initiatives, programs and policies for more efficient Dengue prevention.

Hence, the present study was conducted to assess the awareness and practices regarding Dengue among the rural population of field practicing areas of Chengalpattu Medical College.

Methodology:

Study Settings, Design and Period: A community based cross sectional study was conducted in Health Sub Centre of Salavakkam Primary Health Centre of field practicing area of Chengalpattu Medical College to assess awareness and practice of Dengue control measure among the rural population (n= 165). The study period was November 2022.

Inclusion and Exclusion Criteria: 18 years and above who were willing to participate were included in this study. Those who were not willing to participate, those who were absent on the day of visit and those who were having acute severe illness and bed ridden were excluded in this study.

Sample Size Calculation and Sampling Method:

Based on study conducted by T et al[14] in urban area of Coimbatore district, knowledge about Dengue was 94.1%, considering confidence level of 95%, relative precision of 4 %, with 10% excess sampling to account for non-response, the sample size was calculated and worked out to be 165. Multistage sampling was done.

There are 3 blocks present in Chengalpattu Medical College field practicing area. Among these blocks Manampathi block was chosen by Simple Random Sampling method. There are 5 Primary Health Centres present in Manampathi block. Out of 5 PHCs Salavakkam PHC was selected by Simple Random Sampling.

Among the five Health Sub Centres in Salavakkam PHC three HSCs were selected by Simple Random Sampling method. From each HSC, 55 participants were randomly selected.

Data Collection Procedure: Data was collected by face-to-face interview using a semi structured questionnaire. The interview was conducted privately and assured of the confidentiality of the interview. WHO COVID-19 prevention protocols such as using face mask, maintaining physical distancing, and using hand sanitizer were followed during data collection time.

Data Collection Tool: The study tool is a semi-structured self-administered questionnaire. The Questionnaire had two sections:

Section A: This section includes socio demographic information such as age, gender, religion, occupation, socio economic status and family details. The socio economic status was classified based on Modified BG Prasad scale[15,16].

Section B: This section is to assess the level of awareness and practices towards Dengue control among study participants. Awareness and practice were scored with

all right answer as 1 mark and incorrect answer as 0 mark and the median was taken as the cutoff point.

Inadequate awareness was considered as those who scored <10 and for poor practice those who scored < 7. The questionnaire were designed and translated in local language. Informed consent was obtained from the participants before

interview, confidentiality and privacy was maintained during the data collection.

Data Analysis: The data was entered in MS Excel and analyzed using SPSS Version 25. Appropriate descriptive and inferential statistics like Chi square test, Fisher's Exact Test done and p value of < 0.05 was taken as significant.

Results:

Table 1: Socio demographic details of the study participants (n=165)

Variables		Frequency	Percent
Age	< 40 years	96	58.2
	> 40 years	69	41.8
Gender	Male	107	64.8
	Female	58	35.2
Religion	Hindu	145	87.9
	Christian	17	10.3
	Muslim	3	1.8
Educational status	Illiterate	44	26.6
	Primary education	38	23.0
	Middle school	29	17.6
	High school	32	19.5
	Higher secondary school	11	6.7
	Degree	11	6.7
Occupation	Working	94	57.0
	Not working	71	43.0
Type of family	Nuclear family	120	72.7
	Joint family	9	5.5
	3- generation family	36	21.8
Socio economic status	Upper class	5	3.0
	Upper middle	35	21.2
	Middle	36	21.8
	Lower middle	43	26.1
	Lower class	46	27.9
Type of house	Pucca hose	63	38.2
	Semi pucca house	57	34.5
	Kutch house	45	27.3
Over crowding	Yes	80	51.5
	No	85	48.5
Cattle shed	Yes	8	4.8
	No	157	95.2
Marital status	Married	101	61.2
	Unmarried	64	38.8

Table .1 shows that among the 165 study participants, 58.2% were below 40 years of age group and 64.8% were males. The

mean age of the study participants were 40 years \pm 11.276. 87.9% participants belonged to Hindu religion. Among the

study participants 73.4% were educated and majority of the study participants involved in agricultural work. 72.7% of the study participants belonged to nuclear family and 38.2% were living in pucca house. Of this study participants 26.1% belonged to lower middle class socio

economic status and 27.9% were in Lower class of socio economic status according to Modified BG Prasad classification. Overcrowding was present in 51.5%. 61.2% participants got married and 4.8% participants had cattle shed near their houses.

Socio economic status of study participant (n = 165)

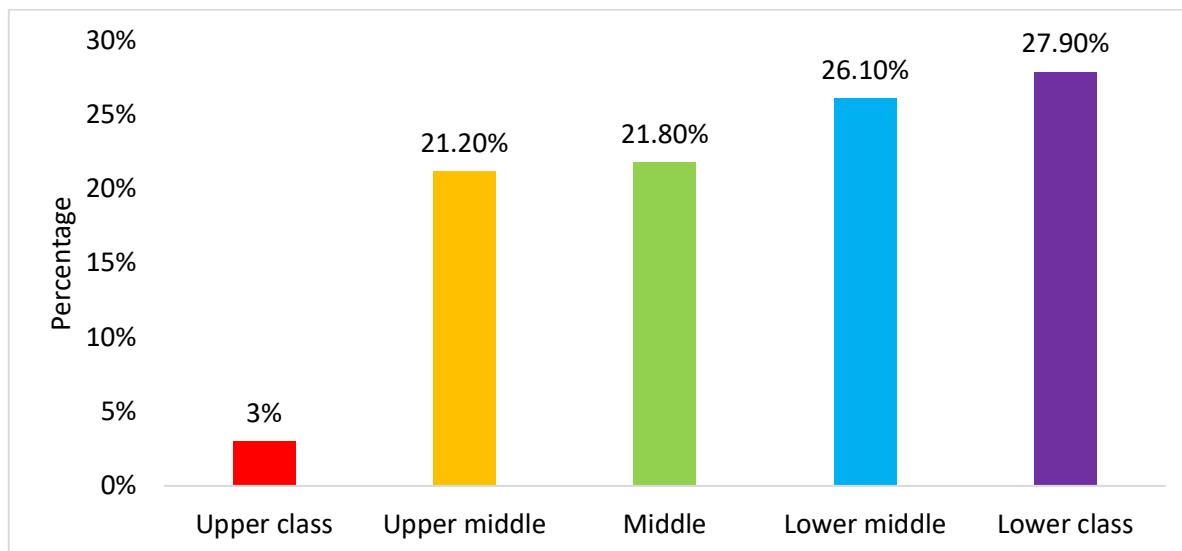


Figure 1: Socio economic status of study participant

Above figure shows most of the study participants 27.9% belonged to lower socio economic status followed by lower middle class(26.1%), middle class(21.8%), upper middle class(21.2%) and upper class(3%).

Table 2: Awareness of Dengue control among study participants (n=165)

	Frequency	Percent
Heard about Dengue		
Yes	135	81.8
No	30	18.2
Source of information		
Health personnel	53	32.1
Radio/ Tv	51	30.9
Newspaper/ Magazine	38	23.0
Relative and friends	23	14.0
Dengue is transmissible		
Yes	93	56.4
No	72	43.6
Dengue is transmitted through		
Human contact	13	7.9
Blood transfusion	7	4.2
Mosquito bite	86	52.1
Sharing of food	12	7.3
Sharing of needle	12	7.3
Don't know	35	21.2

High fever		
Yes	142	86.1
No	23	13.9
Pain behind eyes		
Yes	31	18.8
No	134	81.2
Head ache		
Yes	90	54.5
No	75	45.5
Joint pain		
Yes	88	53.3
No	77	46.7
Vomiting and abdominal pain		
Yes	36	21.8
No	129	78.2
Severe body aches		
Yes	68	41.2
No	97	58.8
Red spots on the body		
Yes	19	11.5
No	146	88.5
Mode of spread of Dengue		
Mosquito bite	143	86.7
Dirty drinking water	15	9.1
Contaminated food	7	4.2
Dengue fever caused by which Mosquito		
Aedes	16	9.7
Anopheles	19	11.5
All mosquito	31	18.8
Don't know	99	60.0
At what time does the mosquito which spread Dengue bites mostly?		
Sun set/rise	26	15.8
Night	49	29.6
afternoon	14	8.5
Don't know	76	46.1
Common breeding site		
Over head tank	3	1.8
Artificial container	25	15.2
Ditches	38	23.0
Don't know	99	60.0
Do you know any methods to kill the mosquito larva		
Yes	82	49.7
No	83	50.3
Methods to kill larva		
Oil	44	26.7
Fish	25	15.2
Empty the container	56	33.9

All of the above	40	24.2
Do you know any methods to control adult mosquito		
Yes	135	81.8
No	30	18.2
Methods to control adult mosquito		
Net	20	12.1
Coil	66	40.0
Cream/ liquid	16	9.7
Fogging	23	14.0
All of the above	40	24.2
Do you know whether the mosquito breed in the water collected in back of fridge, plate kept below flower pot and roof gutter		
Yes	37	22.4
No	128	77.6

Among the study participants 81.8% heard about the Dengue fever. About 32.1% of the study participants responded that Health personnel played an important role as a source of spreading awareness regarding Dengue fever.

30.9% of the study participants had become aware of Dengue fever only through mass media. In this study 23% of the participant got information from Newspaper and magazine . Only 14% had become aware of Dengue fever through their family members and relatives.

Among the study participants 52.1% knew that Dengue is transmitted by mosquito and 86.7% of the study participant had awareness about mode of spread. Only

15.8% were aware about mosquito bite time correctly. Of the study participants one third of them knew the signs and symptoms of Dengue fever. In this study, only 9.7% were able tell about name of the mosquito (Aedes) transmitting Dengue fever.

15.2% of the study participants had awareness about the breeding sites of the Aedes mosquito. Among the study participants 49.7% knew the methods to kill mosquito larva and 81.8% had awareness about the methods to control adult mosquito.

Source of information about Dengue fever among the study participant (n=165)

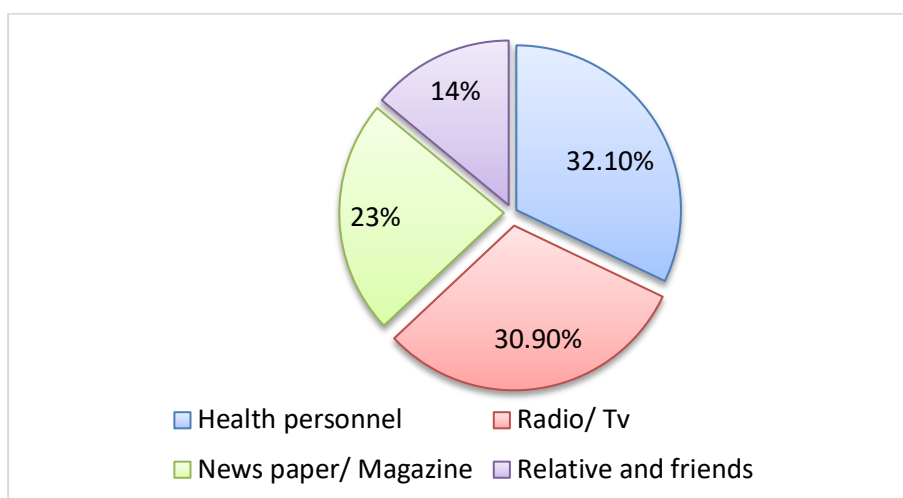


Figure 2: Source of information about Dengue

Above figure 32.1% of the study participants got information about Dengue from health personnel . 30.9% and 23% of the study participants had received information about dengue fever from mass media and Newspaper respectively. Only 14% received information from relative and friends.

Table 3: Practice towards Dengue control among study participants (n=165)

	Frequency	Percent
Do you store water in house for usage		
Yes	63	38.2
No	102	61.8
Did you turn unused containers upside down to prevent water stagnation		
Yes	55	33.3
No	110	66.7
Do you close the container used for storage of water with lid		
Yes	102	61.8
No	63	38.2
see any mosquito larvae in the water storage container, do you take any step do make it clear		
Yes	22	13.3
No	143	86.7
Do you use any personal protective measures for mosquito bite		
Yes	152	92.1
No	13	7.9
Coil		
Yes	117	70.9
No	48	29.1
Net		
Yes	47	28.5
No	118	71.5
Cream/ Liquidator		
Yes	71	42.7
No	94	57.3
Do you check and clean your house drain and roof during the rainy season?		
Yes	59	35.8
No	106	64.2
Do you use traditional medicine (Siddha) to treat dengue		
Yes	70	42.4
No	95	57.6
Do you participated any dengue control activities in your community		
Yes	21	12.7
No	144	87.3
Do you check and clean roof gutter in any season		
Yes	58	35.2
No	107	64.8
During rainy season did you check for any breeding sites in terrace		
Yes	45	27.3
No	120	72.7
Did you remove unused bottle/lids/coconut shell, broken buckets/ paint buckets use and through paper cups and plates		
Yes	49	29.7
No	116	70.3

Among the study participants 33.3% had the activity of turning unused containers upside down to prevent water stagnation.

13.3% of study participants had the habit to take steps to remove mosquito larvae in the water storage container. Most of the study participant (92.1%) adopted mosquito protective measures.

Among these 30.9%, 28.5% and 42.7% used coil, net and cream/liquidator respectively. Of this study 35.8% of the participants had a habit of check and clean

your house drain and roof and 27.3% checked for any breeding sites in terrace during rainy season and 35.2% had regular activity check and clean roof gutter in all season.

Among the study participants 29.7% had regular activity to remove unused bottle/lids/coconut shell, broken buckets/paint buckets use and through paper cups and plates.

Personnel protective measures practiced among study participants

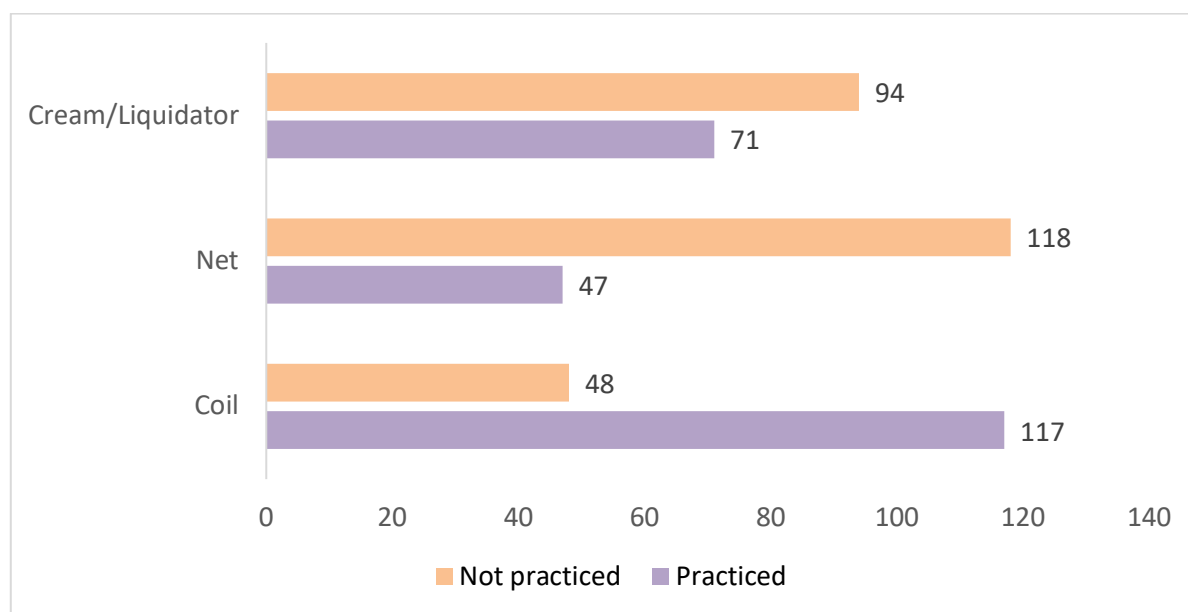


Figure 3: Personnel protective measures practiced by study participants

Above figure shows that majority of the study participants 117(70.9%)practiced mosquito coil as a protective measures for mosquito bite . Only 47(28.5%) participant used net as protective measures for mosquito bite.

Table 4: Awareness and Practice of Dengue among study participants

Variable		Frequency	Percent
Awareness	Adequate	101	61.2
	Inadequate	64	38.8
Practices	Good Practice	58	35.2
	Poor practice	107	64.8

Above table shows that 61.2% of the study participants had adequate knowledge about Dengue fever and 38.8% had inadequate knowledge. 35.2% had good practices towards Dengue control measures.

Table 5: Factors affecting the Awareness and practice towards Dengue control

Variable		Adequate awareness n (%)	Test and value	p value	Good Practice n (%)	Test and value	p value
Age group	< 40 years	66(68.8%)	Chi-Square 5.494	0.019*	29(30.2%)	Chi-Square 2.461	0.117
	> 40 years	35(50.7%)			29(42%)		
Gender	Male	72(67.3%)	Chi-Square 4.736	0.03*	37(34.6%)	Chi-Square 0.044	0.834
	Female	29(50%)			21(58%)		
Educational status	Illiterate	21(47.7%)	Chi-Square 4.595	0.032*	13(29.5%)	Chi-Square 0.827	0.461
	Literate	80(66.1%)			45(37.2%)		
Occupation	Working	50(53.2%)	Chi-Square 5.919	0.015*	35(37.2%)	Chi-Square 0.416	0.519
	Not working	51(71.8%)			23(32.4%)		
Socio economic status	Upper class	4(80.4%)	Fisher's Exact Test	0.237	2(40%)	Fisher's Exact Test	0.511
	Upper middl	18(51.4%)			14(40%)		
	Middle class	27(75.0%)			16(44.4%)		
	Lower middl	24(55.8%)			13(30.2%)		
	Lower class	28(60.9%)			13(28.3%)		
Marital status	Married	58(57.4%)	Chi-Square 1.572	0.21	42(41.6%)	Chi-Square 54.727	0.03*
	Unmarried	43(67.2%)			16(25%)		

*p value < 0.05, significant

Statically Analysis

Statistical tests of significance were done for Awareness and practices with age group, gender, educational status, occupation, socio economic status and marital the course of study in the Table.4. There was a statistically significant association between the age group < 40 years and adequate awareness (p=0.019). But not adequately practicing Dengue control measures (p=0.117).

67.3% of male participants had adequate knowledge compare with female. There was statistically significant association between gender and awareness about Dengue(p=0.03). There was no association between the gender and practices (p=0.834). Educated participants had

adequately aware about Dengue. A statistically significant association was seen between educational status and awareness (p=0.032). but there was no significant association seen between educational status and practices towards Dengue control (p=0.461).

Approximately both working and not working study participants had adequate awareness about Dengue fever. A statistically significant association was found between occupation and awareness (p=0.015). But there was no significant association seen between occupation and practices towards Dengue control measures (p = 0.519). A statistically significant association was not found between socio economic status and

awareness about Dengue($p=0.237$). There was no significant association seen between socio economic status and practices towards Dengue control ($p=0.511$).

Among the study participants married persons had adequate knowledge about Dengue awareness. A statistically

significant association was not found between marital status and awareness about Dengue ($p = 0.21$). But married person had good practices towards Dengue control measures. There was a statistically significant association seen between marital status and practices towards Dengue control ($p=0.03$).

Table 6: Dengue Awareness Versus Practices towards Dengue control measures (n=165)

Variable		Good practice	Poor practice	Test and value	p value
Awareness	Adequate	46(79.3%)	55(51.4%)	Chi square 12.339	0.000*
	Inadequate	12(20.7%)	52(48.6%)		

* p value < 0.05 , significant

Among the participants who had good practices 79.3% had adequate awareness about Dengue. A statistically significant association seen between knowledge and practices ($p=0.000$).

Gender distribution of adequate knowledge and good practice among study participants

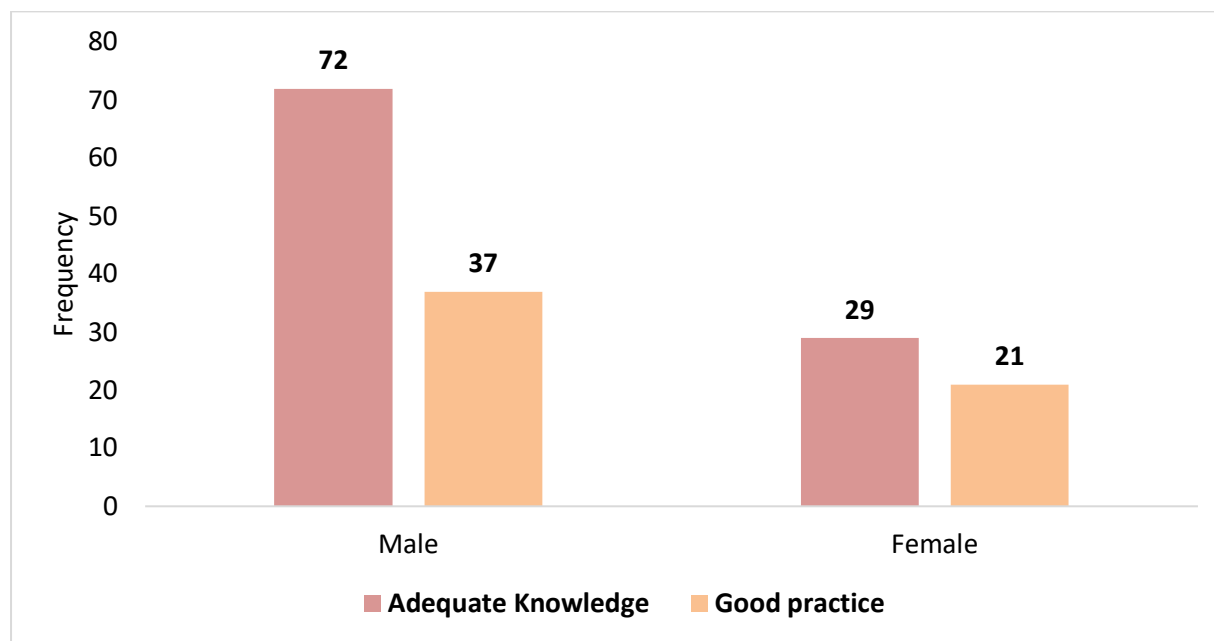


Figure 4: Gender distribution of adequate knowledge and good practice

Above figure shows that among the male participants (107) only 72(67.2%) members had knowledge about Dengue and 37(34.5%) members practiced Dengue control measures. Among the female participants (58) only 29 (50%) had knowledge about Dengue and 21(36.2%) members practiced Dengue control measures.

Discussion

This study was done to find out the awareness level and the practice towards Dengue control measure among the rural population residing in field practicing area of Chengalpattu Medical College. Mean age of the participants of this study was 40 years \pm 11.276. Majority participants were males. These findings were similar to the results obtained by studies conducted by T

et al (2018), Johnpaul et al (2020) and Khan et al (2022) [14,17,18] where males are predominant. Similar study conducted by Elson et al [19] at Villa El Salvador Peru in 2020 where most of the study participants were females.

In this study 73.4% were literate and 57% were depending on agricultural work. Similar findings obtained from the studies conducted by T et al, Basra et al (2019) and Chellaiyan et al (2017) [14,20,21] shows the study participants were literate 93.4%, 90.8%, 79.5% and 89.4% respectively. There was a statistically significant association seen between age (< 40 years, $p=0.019$) and educational status (Literate, $p=0.03$) with awareness about Dengue. Similar report found in study conducted by Hossain et al [22] in Bangladesh 2021 (Age $p=0.000$, Educational status $p=0.000$) and T et al [14] in urban population of Coimbatore, Tamilnadu (Age $p=0.001$, Educational status $p=0.001$). Of this study 27.9% study participants belonged to class v of socio economic status based on Modified BG Prasad socio economic status classification. In contrast with this findings, majority of study participants belonged to class I socio economic status in studies conducted by T et al and Chellaiyan et al [14,21]. 61.2% of the study participants got married in this study. These findings similar to the results obtained by studies conducted by Basra et al and Hossain et al [20,22]. There was no significant association between socio economic status with awareness and practice of the Dengue control measures. But in study conducted by Hossain et al [22] in Bangladesh 2021 (0.001) and T et al [14] in urban population of Coimbatore, Tamilnadu ($p=0.000$) reported significant association seen between socio economic status with awareness and practice.

In this study 81.8% of the study population had heard about dengue. This is higher when compared to the results a study done in North Indian city by Malhotra et al [12]

where only 60% of people knew about dengue. But, the results of the study were similar to that obtained by Chellaiyan et al [21] conducted near Chennai where 93.7% of the study participants knew about dengue. This could be due to the fact that because of frequent outbreaks of dengue in South India when compared to North India and also due to awareness campaigns carried out by the government agencies.

In the present study, 32.1% and 30.9% had received information from Health personnel and mass media respectively. But, the results of the study were similar to that obtained by T et al [14] in urban population of Coimbatore district where majority of study participants received information from mass media (72.8%) than health personnel (41.2%) and in study conducted by Phuyal et al [23] in 2022 Central Nepal reported that study participants received information from television (71.8%) and radio (51.5%). 52.1% of the study population were aware that the dengue is transmitted by mosquito bite.

Among them, 9.7% of participants correctly responded that the dengue is transmitted by Aedes mosquitoes. In the study conducted by Malhotra et al [12], 72.62% of the study population were aware about mosquitoes transmitting dengue while Chellaiyan et al [21] had reported 89%.

In this study, most of the study population had correctly responded to the symptoms 86.1%

fever, 54.5% to head ache and 53.3% to joint pain. Similar findings reported in study conducted by T et al [14] where 53.7% had correctly responded to the symptoms. The present study has also highlighted the fact that only about 15.2% participants were aware about the correct breeding habitat of Aedes mosquitoes. In contrast to this findings study conducted by T et al [14] reported one-third of the

study participants were aware about the correct breeding habitat of *Aedes* mosquitoes. Therefore, there is a substantial gap in this study regarding correct knowledge about the breeding places of *Aedes* mosquitoes which needs to be addressed immediately by information, education and communication (IEC) campaigns and targeted interventions. When asked about the mosquito control practices, the majority of the study participants had reported using mosquito coil (70.9%) cream/repellents (42.7%) and net (28.5%). Similar findings observed from study conducted by Chellaiyan et al [21] where most of the participants used coil (63.4). In T et al [14] reported majority of the participants using mosquito in the form of coils (55.2%) followed by mosquito nets, repellent creams and repellent sprays. In previous studies by Malhotra et al reported that the study participants were aware of various mosquito control measures like window screening, mosquito coil, liquid vaporizer and repellent cream. In this study those who had adequate awareness adopted good practices towards Dengue control measures. A statistically significant association found between awareness and practices ($p=0.001$). There was no significant association seen between socio economic status and marital status with awareness. A statistically significant association was not found between age, gender, education, occupation and socioeconomic status with practices towards Dengue control measures.

Conclusion

From this study we conclude that the awareness and practices towards Dengue control measures were 61.2% and 35.2% respectively. It became clear that there is a substantial knowledge gap regarding the numerous facets of dengue disease. Regular awareness activities, such as health education campaigns and home visits to inform people about the mode of

transmission and preventive actions, help close this knowledge gap.

Limitation: This study was conducted in rural population of single block. Similar studies can be done in a community on a wider scale population to obtain the real picture about the knowledge, awareness and mosquito control practices among the rural population.

Recommendation:

1. Health education campaigns and home visits to inform people about the mode of transmission and preventive actions to control Dengue.
2. Qualitative research methods like focused group discussions can be utilized in further studies to have an in-depth knowledge about these objectives among the study population.
3. Source reduction should be continued in all seasons.
4. Inclusion of environmental sanitation to the primary school curriculum can go a long way in creating awareness and decreasing the dengue burden in the community.

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