Knowledge, Attitudes and Practices Regarding Dengue Fever Among Mothers of Paediatric Dengue Victims at Colombo South Teaching Hospital, Sri Lanka

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ABSTRACT

Introduction and Objectives- In the last six years, the Colombo District recorded the highest number of dengue cases, with 20% of those cases managed at the Colombo South Teaching Hospital (CSTH). Understanding knowledge, attitudes, and practices is crucial for designing suitable strategies to combat this potentially deadly disease.

Methods: This hospital-based, cross-sectional descriptive study focused on mothers of pediatric patients receiving treatment for dengue at CSTH.

Results: Among the respondents, 79.22% had knowledge about dengue symptoms, with fever, headache, and joint pain being the most commonly recognized. The overall knowledge about transmission was 82.96%. A total of 75.21% of participants had a good understanding of dengue management, while most were not aware of any potential benefit from papaya in treating dengue.

Despite this, 52.1% of the participants believed there was no treatment for dengue fever. The overall knowledge about breeding places was good, with 82.68% of respondents demonstrating awareness. Additionally, 79% of participants followed mosquito prevention practices, while 83.36% had a positive attitude toward combating dengue. However, only 66.2% of mothers accepted that they were at risk of contracting dengue. Knowledge about the common breeding places of the dengue vector was also high, at 82.68%. Most of the participants obtained their knowledge from television, radio, and newspapers, with an average of 92.91% acknowledging these sources as their primary source of information.

Conclusions: The level of knowledge, attitude, and practice regarding dengue fever among mothers is satisfactory but could be improved. Health authorities should focus on educating all stakeholders with advanced health education to promote appropriate health practices and dispel false beliefs, thereby reducing morbidity and mortality associated with dengue fever.

Keywords: Dengue; Knowledge; Attitudes; Practices; CSTH; Sri Lanka

INTRODUCTION

Dengue is a fast-spreading pandemic viral disease, especially prevalent in urban slums and suburbs, but it also affects wealthier neighborhoods in tropical and subtropical countries. Dengue is a mosquito-borne viral infection causing severe flu-like illness and sometimes leading to a potentially lethal complication called severe dengue. According to the World Health Organization (WHO), the incidence of dengue has increased 30-fold over the last 50 years. Up to 50-100 million infections are now estimated to occur annually in over 100 endemic countries, putting almost half of the world's population at risk.

The *Aedes aegypti* mosquito is the main vector that transmits the dengue viruses. The viruses are passed on to humans through the bites of infective female Aedes mosquitoes, which mainly acquire the virus while feeding on the blood of an infected person. Children are the primary victims of this disease, and mothers play an important role in preventing their kids from dengue virus infection. The burden of disease and severe dengue is predominantly found in children, and secondary DEN infection is a risk factor for severity in children.

The Colombo South Teaching Hospital (CSTH) in Kalubowila is a well-recognized and established teaching hospital in the Colombo district. CSTH is a 1249-bed multi-specialty teaching hospital. It is the main tertiary care institution providing care to dengue victims in its catchment areas.

During the last six years, the Colombo district has recorded the highest number of cases. In 2017, the total number of cases rose to 186,101, with the Colombo district alone reporting 34,274 cases. Out of these cases, the Colombo South Teaching Hospital managed a significant number, accounting for an average of 20 percent of the case load (Table 2).

Table 1: Notified Dengue Cases 2014 to 2019 - Colombo District and Country Statistics

Year	Total Cases	Colombo District	Percentage
2019	104695	20718	19.78 %
2018	51659	10258	19.86 %
2017	186101	34274	18.42 %
2016	55150	16767	30.40 %
2015	29777	9881	33.18 %
2014	47502	14711	30.96 %

The catchment areas of Colombo South Teaching Hospital have recorded the highest number of dengue cases for the last five years, and CSTH has reported the highest number of dengue cases.

Table 2: Notified Dengue Cases 2014 to 2019 - Colombo District and Colombo South Teaching Hospital

Year	Colombo District	CSTH	CSTH-Percentage
2019	20718	4210	20.32 %
2018	10258	1765	17.20%
2017	34274	7029	20.50%
2016	16767	4031	24.04%
2015	9881	2797	28.30%
2014	14711	5168	35.13%

METHODOLOGY

This is a hospital-based cross-sectional descriptive study conducted in the Pediatric wards of the Colombo South Teaching Hospital. It utilized a self-administered, validated questionnaire adopted to fit the Sri Lankan context.

ANALYSIS AND FINDINGS

Most of the participants (51%) are between 30-40 years old, 19 percent belong to the 41-50 years age group, and 16.7 percent are in the 21-30 years age group. Only 7.4% of participants are over 50 years old, and 5.9 percent are below 20 years of age. The majority of participants (42.6%) have passed the G.C.E (O/L), and only 6.7% are graduates or post-graduates. Among mothers, 27.9 percent have passed G.C.E (O/L), 9.2 percent have secondary education, and 9.7 percent have primary education, while 3.8 percent state they have no formal schooling in this sample.

In this study, the majority of participants (47.4%) are unemployed, with students comprising 5.1 percent. Self-employed and government-employed individuals make up 15.4 and 13.1 percent, respectively, while private sector employees account for 16.7 percent. A significant proportion of participants (30.5%) earn between Rs 10,001 and Rs 20,000 per month, with another 23.6 percent earning between Rs. 20,001 and Rs 30,000, and 19.7 percent falling into the Rs 30,001 – Rs 40,000 earning group. There are only 39 participants in the Rs40,001 to Rs 50,000 group and 27 participants earning more than Rs 50,000 per month, while 9.2% of participants earn less than Rs 10,000 per month.

In Sri Lanka, the Sinhalese are predominant. This study reflects that 82.8 percent of participants are Sinhalese, while 10 percent are Sri Lankan Moor, 5.9 percent are Sri Lankan Tamils, and 0.5 percent are Indian Tamils.

Table 3: Description of the Knowledge of Symptoms

	Symptoms		Frequency	Percentage	Mean	SD
1	Is fever a symptom of dengue?	Yes	373	95.6	1.0538	0.26766
		No	13	3.3		
		DN	4	1.0		
2	Is headache a symptom of dengue fever?	Yes	354	90.8	1.1333	0.44510
		No	20	5.1		
		DN	16	4.1		
3	Is joint pain a symptom of dengue fever?	Yes	330	84.6	1.2641	0.64493
		No	17	4.4		
		DN	43	11.0		
4	Is muscle pain a symptom of dengue fever?	Yes	305	78.2	1.3744	0.74057
		No	24	6.2		
		DN	61	15.6		
5	Is pain behind the eyes a symptom of dengue Fever?	Yes	195	50.0	1.8538	0.91358
		No	57	14.6		
		DN	138	35.4		
6	Is abdominal pain a symptom of dengue fever	Yes	323	82.8	1.2821	0.65123
		No	24	6.2		
		DN	43	11.0		
7	Is bleeding from any part of the body is a symptom of dengue?	Yes	283	72.6	1.4487	0.80563
		No	43	11.0		
		DN	64	16.4		
	The overall Knowledge of Symptoms	Positive	2163	79.22		
		Negative	198	7.2571		
		DN	369	13.5		

Pain behind the eyes, a symptom of dengue fever, has the highest mean (1.8538) with the highest standard deviation. Only 50 percent of the participants responded correctly. On the other hand, fever, a symptom of dengue, and headache, another symptom of dengue fever, have the lowest means respectively (1.0538 and 1.1333). Overall, participants demonstrate very good knowledge about the common symptoms."

Table 4: Description of the Knowledge of Transmission

	Knowledge of Transmission		Frequency	Percentage	Mean	Std. Deviation
1	Do flies transmit dengue fever?	Yes	7	1.8	2.0282	0.26194
		No	366	93.8		
		DN	16	4.1		
2		Yes	8	2.1	2.0154	0.24791
		No	369	94.6		

	Do ticks transmit dengue fever?	DN	12	3.1		
3	Do all types of mosquitoes transmit dengue fever?	Yes	18	4.6	2.0128	0.33223
		No	350	89.7		
		DN	21	5.4		
4	Does person to person contact transmit dengue fever?	Yes	43	11.0	1.9769	0.45006
		No	314	80.5		
		DN	32	8.2		
5	Window screens and bed nets reduce mosquitoes?	Yes	219	56.2	1.4538	0.52854
		No	165	42.3		
		DN	6	1.5		
Over all Knowledge of Transmission		Yes	1618	82.96		
		No	241	12.36		
		DN	87	4.46		

The knowledge of transmission means are numerically close to each other. Knowledge regarding flies transmission, ticks transmission, and mosquito types transmission are good, with high means (2.0282, 2.0154, and 2.0128) and low standard deviations (0.26194, 0.24791, and 0.33223) for the above three questions. 93.8%, 94.6%, and 89.7% answered correctly, while the other two questions were answered positively.

Table:5 Description of the Knowledge of Management

Knowledge of Management		Frequency	Percent %
Would you take Aspirin for dengue?	Yes	35	9.0
	No	328	84.1
	Don't know	27	6.9
Would you take pain killers for dengue?	Yes	97	24.9
	No	280	71.8
	Don't know	13	3.3
Would you get rest for dengue fever?	Yes	370	94.9
	No	17	4.4
	Don't know	3	.8
Do we need to do any blood test to confirm dengue?	Yes	381	97.7
	No	7	1.8
	Don't know	2	.5
Would you drink adequate fluids for dengue fever?	Yes	374	95.9
	No	15	3.8
	Don't know	1	.3

Is there a treatment for dengue fever?	Yes	203	52.1
	No	108	27.7
	Don't know	79	20.3
Papaw cures dengue	Yes	38	9.7
	No	117	30.0
	Don't know	235	60.3
Over all Knowledge About Management	Positive	2053	75.21
	Negative	317	11.61
	Don't know	360	13.2

Most of the independent variable means are close to the correct answers, with low standard deviation, indicating good overall knowledge about management among participants. Among these independent variables, "Papaya cures dengue" has the highest mean (2.5051) with a high standard deviation (0.66782), indicating that most participants do not have any idea about this variable. Additionally, most participants believe that there is no treatment for Dengue fever (Mean 1.6821) with values spread out over a wider range (SD 0.78967).

Table 6: Description of Knowledge of Breeding Places

Knowledge of Breeding Places		Frequency	Percent %
Dengue vector can breed in discarded non bio-degradable items	Yes	248	63.6
	No	101	25.9
	Don't know	41	10.5
Dengue vector can breed in Sea	Yes	12	3.1
	No	335	85.9
	Don't know	43	11.0
Dengue vector can breed in discarded biodegradable items	Yes	98	25.1
	No	236	60.5
	Don't know	56	14.4
Dengue vector can breed in uncovered water storage tanks, containers	Yes	369	94.6
	No	14	3.6
	Don't know	7	1.8
Dengue vector can breed in ornamental & fancy items where water can be collected	Yes	372	95.4
	No	9	2.3
	Don't know	9	2.3

Dengue vector can breed in special home appliances water collections	Yes	309	79.2
	No	72	18.5
	Don't know	9	2.3
Dengue vector can breed in water containing small containers inside and outside of the house	Yes	378	96.9
	No	3	.8
	Don't know	9	2.3
Dengue vector can breed in plants/ parts of plants, tree hole	Yes	333	85.4
	No	36	9.2
	Don't know	21	5.4
Over all Knowledge about Dengue vector breeding Places	Positive	2580	82.6875
	Negative	345	11.0625
	Don't know	195	6.25

Most of the independent variable means are close to the correct answers, with low standard deviation, so the overall knowledge about breeding places is good among participants. However, the independent variable "Dengue vector can breed in discarded biodegradable items" has a mean value of 1.8923 with a high standard deviation (0.61989). Among all independent variables, knowledge about this variable is poor among participants.

Table 7: Description of the Sources of Dengue Information

Sources of Dengue Information		**Frequency**	**Percent %**
TV/Radio	Yes	384	98.5
	No	1	.3
	Don't know	5	1.3
Health workers	Yes	378	96.9
	No	11	2.8
	Don't know	1	.3

Brochures	Yes	338	86.7
	No	41	10.5
	Don't know	11	2.8
Newspaper	Positive	377	96.7
	Negative	7	1.8
	Don't know	6	1.5
Internet and Social medias (Face book)	Yes	351	90.0
	No	15	3.8
	Don't know	24	6.2
Neighbors	Yes	346	88.7
	No	36	9.2
	Don't know	7	1.8
	Positive	2174	92.91667
	Negative	111	4.733333
	Don't know	54	2.316667

The dengue information disseminated through almost all means, including TV, radio, newspapers, and healthcare workers, played a significant role.

Table 8: Description of the Attitude towards Dengue

Attitude towards Dengue	N	Mean	Std. Deviation
Dengue is a serious illness?	389	1.0977	.38759
Yourself /other children are at risk of getting dengue	390	1.4564	.69659
Dengue fever can be prevented	390	1.1974	1.11751

Dengue is a serious illness, and Dengue fever can be prevented" variables means are close to 1 (1.0977 & 1.1974), so the attitude towards the above two variables is positive among participants. In contrast, the variable "Yourself/other children are at risk of getting dengue" has a mean value of 1.4564, indicating that a significant number of mothers are not accepting the risk of dengue.

Table 9: Description of the Sources of Dengue Prevention Practices

Preventing Mosquito Contact	N	Mean	Std. Deviation
I use insecticide sprays to reduce mosquitoes	390	1.6231	.57271
I use screen windows to reduce mosquitoes	390	1.2538	.51174
I use fans to reduce mosquitoes	390	1.3359	.54842
I use bed nets to reduce mosquitoes	390	1.1641	.41655
I eliminate standing water around the house to reduce mosquitoes	390	1.0487	.24877
I cut down bushes in the yard to reduce mosquitoes	390	1.0667	.27894
I use mosquito coils to reduce mosquitoes	390	1.5615	.56918
I covered water containers in the home	390	1.0872	.34026

I clean the roof gutters at home	390	1.0385	.20547
Waste disposal and container removal done by the municipal council.	389	1.2005	.43185
House inspections done by law enforcing /health authorities	390	1.1872	.51040
I do nothing to reduce mosquitoes	390	1.8359	.45207

The level of prevention practices is good among participants, and most of the variable means are close to 1. However, the means for the variables "insecticide sprays to reduce mosquitoes" and "mosquito coils to reduce mosquitoes" are 1.6231 and 1.5615, respectively, revealing that the above methods are unpopular among participants.

DISCUSSION & CONCLUSIONS

This study was primarily conducted to explore the Knowledge, Attitudes, and Practices regarding dengue fever among mothers of pediatric dengue victims at Colombo South Teaching Hospital. The mothers of pediatric dengue victims constitute the study population. The findings reveal important factors that should be considered by healthcare authorities to adopt a more holistic patient-oriented approach to eliminate dengue in Sri Lanka.

- The majority of the participants are considered educated, with 42.6 percent having passed G.C.E (O/L), and only 6.7 percent being graduates or post-graduates. Additionally, 27.9 percent of mothers passed G.C.E (A/L), 9.2 percent have secondary education, and 9.7 percent have primary education, while only 3.8 percent state they have no school education in this sample.

- In this study, the majority of participants (47.4%) are unemployed. Unemployed, young, and low-income people predominantly obtain services from Colombo South Teaching Hospital.

- Pain behind the eyes, a symptom of dengue fever, has the highest mean (1.8538) with the highest standard deviation; only 50 percent of the participants responded correctly. Conversely, fever, a symptom of dengue, and headache, a symptom of dengue fever, have the lowest means, with more than 90% of the participants responding correctly.

- Overall, knowledge among participants about the common symptoms is very good (79.22%).

- The overall knowledge among participants about the common ways of transmission is very good (82.96%). The knowledge of transmission variable means are numerically close to each other.

- The knowledge regarding flies' transmission, ticks' transmission, and mosquito species involved in transmission is good. All three questions were answered correctly by 93.8%, 94.6%, and 89.7% respectively.

- Most of the independent variable means related to the management of dengue are close to correct answers with low standard deviation, so the overall knowledge about management is good among participants.

- "Papaw cures dengue" has the highest mean (2.5051) with a high standard deviation (0.66782); most of the participants do not have any idea about the above variable (60.3%), and about 9.7% believe that papaw cures dengue. Additionally, 27.7% of the participants believe that there is no treatment for dengue fever.

- Most of the independent variable means used to assess knowledge about breeding places are close to correct answers with low standard deviation, so the overall knowledge about breeding places is good among participants (82.68%).

- Dengue information is channeled through almost all means, with TV, radio, newspapers, and healthcare workers playing significant roles.

- "Dengue is a serious illness" and "dengue fever can be prevented" variables have means close to 1 (1.0977 & 1.1974), indicating positive attitudes toward the above variables among participants.

- A significant number (22.1%) of mothers do not accept the risk of dengue to their children.

- The level of prevention practices is good among participants, with most of the variable means being close to 1. However, using insecticide sprays and mosquito coils to reduce mosquitoes are unpopular among participants.

RECOMMENDATIONS

Recommendation 1:

Participants' basic knowledge about dengue symptoms, transmission, management, and mosquito breeding places is very good. This information is disseminated through various channels, including TV, radio, newspapers, and healthcare workers, playing a significant role. Health education to the public should be continued on a regular basis, and healthcare authorities should focus on providing advanced health education to all stakeholders in prevention and management techniques to reduce further morbidity and mortality.

Recommendation 2:

The overall knowledge, attitude, and practices are good among this study population. Healthcare authorities should consider involving all stakeholders, including mothers, for a holistic approach in the battle to eliminate this deadly disease from the country.

Recommendation 3:

Healthcare managers should consider implementing effective bottom-up community participation to achieve an environmentally sustainable control program.

Recommendation 4:

This study was carried out only in the pediatric department of the Colombo South Teaching Hospital. Such research should be extended to adult patients, the community, and all stakeholders to improve the holistic patient care approach.

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