ORIGINAL RESEARCH

A cross sectional study to assess knowledge and stated practice regarding prevention and control of dengue among urban community in Paschim Medinipur, West Bengal

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ABSTRACT
Background: Dengue/ Dengue Haemorrhagic Fever/ Dengue Shock Syndrome is a major public health problem in almost all developing/ underdeveloped country. As no vaccine available till date, the only way for prevention and control is to promote knowledge and practices of the community. **Aim & Objectives:** The aim& objectives of the present study is to assess the Knowledge and stated practice regarding dengue and to find out any association with knowledge and stated practice with selected variables and any correlation between knowledge and practice in urban population in the district of Paschim Medinipur. **Methodology:**400 people were selected by multistage sampling methods to response a structured questionnaire to assess the knowledge and stated practices regarding dengue. **Results:** The median score of knowledge is 9.0 (max 15) and that of stated practice is 9.0 (max 15). 184 (46%) and 181 (45.3%) respondents shows less than median knowledge and stated practice score respectively. Education is associated with the knowledge and monthly family income is associated with stated practice ($p < 0.05$) There is positive correlation between knowledge and practice ($r = 0.63$).
Conclusion: Increase in knowledge and practice of Dengue in community will play an important role in prevention and control of the disease.
Key Words: Dengue, Prevention and Control, Knowledge, Practice

INTRODUCTION

Dengue is fast emerging pandemic-prone viral disease in many parts of the world. Dengue flourishes in urban areas, suburbs and the countryside but also affects more affluent neighbourhoods in tropical and subtropical countries.[1]

Dengue is widespread throughout the tropics, with risk factors influenced by local spatial variations of rainfall, temperature, relative humidity, degree of urbanization and quality of vector control services in urban areas. Before 1970, only nine countries had experienced severe dengue epidemics. Today, the disease is endemic in more than 100 countries in WHO's African, Americas, Eastern Mediterranean, South-East Asia and Western Pacific regions; the Americas, South-East Asia and Western Pacific regions are the most seriously affected. [2]

The numbers of dengue cases are under reported and many cases are misclassified. One recent (2013) estimate indicates that 390 million dengue infections occur every year (95% credible interval 284–528 million), of which 96 million (67–136 million) manifest clinically (with any severity of disease).1 Another (2012) study, of the prevalence of dengue, estimates that 3.9 billion people in 128 countries are at risk of infection with dengue viruses. [3]

About two-third of World's population live in an infected area with dengue vectors mainly *Aedes aegypti*. Currently dengue is endemic in all continents except Europe. Epidemic Dengue Haemorrhagic

Fever (DHF) occurs in Asia, the America and some Pacific Islands. The incidence of DHF is much higher in the Asian countries than in other regions of the world.[4]

The worldwide incidence of Dengue fever is estimated to be 50 to 100 million and over 5,00,000 cases of dengue haemorrhagic fever cases are diagnosed per years, out of these 90% are children within the age of 15 years and 5% of them are affected by dengue haemorrhagic fever cases. Annually, approximately 24,000 deaths are attributed to dengue worldwide. In 2007 there were more than 8, 90,000 reported cases of dengue in the America, of which 26,000 cases were dengue haemorrhagic fever. In 2007, Venezuela reported over 80,000 cases of Dengue Fever including more than 6,000 cases dengue haemorrhagic fever. Indonesia reported 45,688 cases of Dengue fever with 492 deaths, Thailand reported 93,131 cases with139 deaths and Malaysia reported 10,753 cases with 54 deaths. Around 100 to 200 cases were reported annually in U.S.A. around 214 cases were registered in Argentina in 2002, and in the same year has registered Brazil 7, 80,644 cases.[5]

The mortality rate due to dengue fever is referred to be over one million every year. Dengue is a mosquito-borne infection that has become a vital public health concern. It is a disease found in most tropical and subtropical areas of the world and had become the most common arbo viral disease of human. Dengue fever is an acute febrile disease due to a viral infection and followed by severe headache, eye pain, high fever, backache, vomiting, muscle and joint pain as well as skin rash. It is alsoknown as Dengue Haemorrhagic Fever. Dengue is caused by the infection of dengue virus. Dengue fever has emerged as an important public health problem in Malaysia as it has become endemic throughout the country. Prevention plays a vital role in the control of dengue fever. Primary prevention aims to provide health education and community participation. [6]

The global incidence of dengue has grown dramatically in recent decades. About half of the world's population is now at risk.[7]The incidence of dengue has grown dramatically around India in recent years, the actual case of dengue report may be varied place to place due to improper reporting, In India, according to union health ministry 2017, there are total 100794 cases reported and a total of 172 death reported, resulting a Case Fatality Rate (CFR) of 0.17 provisional till 22th october2017.

In India, according to union health ministry 2017, there are a total of 10697 cases reported till 22 October 2017 in West Bengal. In the year 2016 west Bengal reported the highest no of death across the country with 45 deaths and 22865 cases with a CFR of 0.20.

JUSTIFICATION

There is a no effective vaccine or clinical cures for dengue fever. Vector control remains a key strategy for prevention and can be accomplished through removal of water-holding containers that serve as *Aedes aegypti* breeding sites, use of insecticide sprays to kill adult mosquitoes, or reducing human contact with mosquitoes via use of screens and bed nets or other modifications to daily activity spaces. Eliminating breeding sites is dependent on human knowledge and action and can be promoted at low cost in resource-constrained communities.[8]

Urbanization and poor management of garbage in the city limits has resulted in increase in the breeding site for *Aedes aegypti* which is a vector for dengue fever. There is little study to find out the knowledge and practice gap in community. So it is necessary to find out the level of knowledge and stated practices among the community members in prevention and control of Dengue fever.

The **aim** of the study was to assess the knowledge, awareness and stated practices towards dengue fever in urban area of Paschim Medinipur district. In recent years there is high incidence of dengue cases in Paschim Medinipur.

The **Objectives** of the study were to

1. To assess the knowledge on prevention and control of Dengue among urban community in Paschim Medinipur.
2. To assess the stated practice on prevention and control of Dengue among urban community in Paschim Medinipur.
3. To identify association between the selected variables with knowledge on prevention and control of dengue urban community in Paschim Medinipur.
4. To identify association between selected variables with stated practice on prevention and control of dengue.
5. To find out correlation between knowledge and stated practices (if any) regarding Dengue prevention and control.

METHODOLOGY

Study population - The target population of the study was the urban population in the district the Paschim Medinipur of West Bengal (as per 2011 census 7, 22,686).

Study design– A community based cross-sectional study design to identify the knowledge and stated practices of urban community regarding prevention of dengue fever in selected municipalities and wards in the district of Paschim Medinipur.

Operational definitions

DENGUE FEVER- Dengue fever is an acute mosquito borne viral disease, which is mainly transmitted by *Aedes aegypti*.

KNOWLEDGE-In the study, knowledge refers to the correct response of community to questions stated in the questionnaire, which consists of topic of Transmission of disease, Signs, symptoms and diagnosis, Prevention and control, Treatment on dengue control and prevention.

STATED PRACTICE-In the study, Stated Practice refers to the actions intended to positive response related to Personal Protection, Environmental control and source reduction, Service Provider for prevention of dengue fever as stated by respondents.

SAMPLING PROCEDURE
There were 7 municipalities in the district of Paschim Medinipur. Based on the previous report of dengue incidence, the municipalities are divided into two strata- one municipality with higher incidence and other with lower incidence. I selected one municipality from each stratum with random sampling method. 10 wards were selected from each selected municipality by random sampling method .20 households was selected randomly from each ward. I selected one adult member randomly from each selected household.
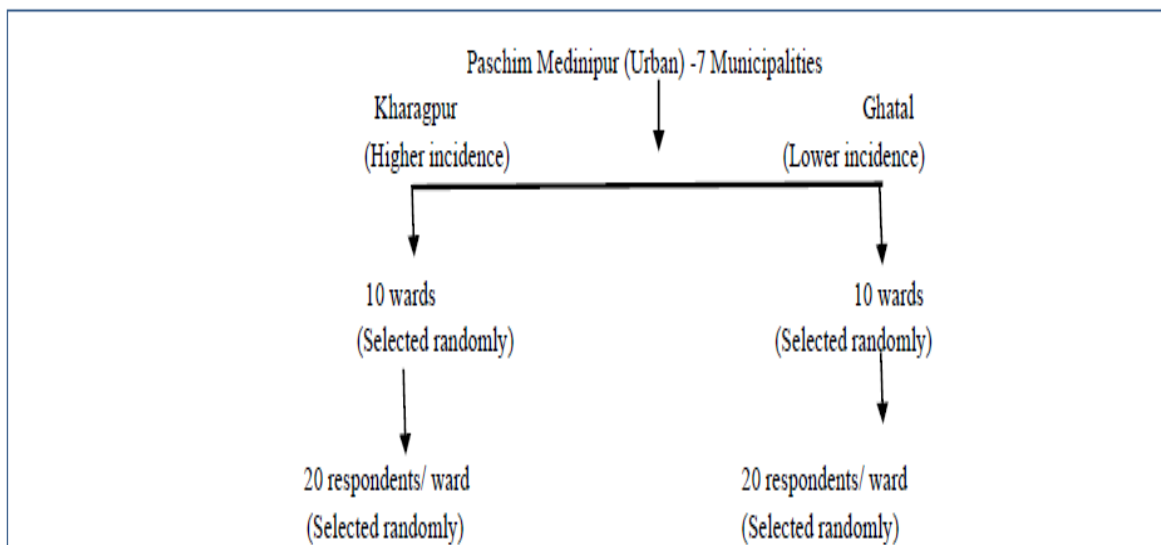
Sample size-– Sample size calculated was 200 in each municipality, assuming 50% population having good knowledge and stated practices, with confidence level of 95% and allowable error of 10% and design effect is 2.0. So, the total sample size for the study is 400 for the study.

$$n = \frac{\alpha\, p\, (1-p)}{d^2}$$

Data collection –We used a pretested and validated structured interview schedule questionnaires for the respondents, conducted in the month of December 2017 and January 2018. The tool for questionnaire consists of following sections:
Section 1 - Data was collected regarding age, sex, educational status, economic condition, occupational status by a validated structure questionnaire.
Section 2 - structured questionnaire was used to access the knowledge regarding dengue fever. It covered the topic of Transmission of disease, Signs, symptoms and diagnosis, Prevention and control, Treatment on dengue control and prevention.

Section 3 - It consists of structured questionnaires regarding stated practice of Dengue.

Data analysis
Statistical analysis of the data was done using statistical Microsoft Excel and Stata version 12. The data was analyzed by the following procedures:
a) In the form of frequencies, percentage, mean, median, mode, standard deviation, and range.
b) Knowledge scores was measured as the two categories i.e. knowledge less than median, knowledge equal or greater than its median value.
c) Stated practice was measured in similar way as knowledge was measured.
d) Association was analyzed between knowledge and socio demographic variable like age, gender, occupation, education, income by using chi-square value.
e) Association between practice and above-mentioned socio-demographic variables was analyzed by same method.
f) Association between knowledge and practice was done using Pearson correlation co-efficient.

RESULTS

Table1 - Frequency and percentage distribution of respondents according to socio-demographic variable of respondents, Paschim Medinipur (urban) 2018.   **[n=400]**

Demographic characteristics	Frequency	Percentage
Type of Family		
Joint	225	56.25
Religion		
Hindu	283	70.75
Muslim	112	28
Christian	5	1.25
Gender		
Female	209	52.25
Marital status		
Married	316	79
Single	81	20.25
Divorce	3	0.75
Education		
>=Higher secondary school	151	37.75
Occupation		
Agriculture	13	3.25
Service	79	19.75
Business	87	21.75
Unemployed	42	10.5
Housewife	145	36.25
Others	34	8.5
Age		
>=30 years	307	76.75
Income		
Monthly family income > Rs. 10000	221	55.25

The Table 1 above shows that majority of the respondents was more than 30 years of age 307 (76.75%), belong to joint family 225 (56.25%), Hindu by religion 283 (70.75%), female in gender 209 (52.25 %), married 316 (79%) and house wife in profession 145(36.25%). The majority of the respondents completed their higher secondary or higher education 151 (37.75%) and had a family income more than ten thousands Rupees 221 (55.25%).

Table2 - Mean, median and standard deviation of Knowledge score of respondents, Paschim Medinipur (urban) 2018   **[n=400]**

Variable	Range of Score	Median	Mean	SD
Knowledge Score	2-15	9	8.86	2.46
Score: Maximum - 15, Minimum - 0				

The Table 2 above indicated that knowledge score regarding control and prevention, mean was 8.86, median 9, range 2-15, and standard deviation was 2.46, where maximum possible knowledge score ranges from 15 to 0.

Table3 – Distribution of the respondents according to level of Knowledge score of respondents, Paschim Medinipur (urban) 2018   **[n=400]**

Level of Knowledge	Frequency	Percentage
<Median	184	46
>=Median	216	54

The table 3 showed that only 216 (54%) respondents had knowledge score which is equal or greater than it's median score value and the rest i.e. 184 (46%) had less than median knowledge score.

Table 4 - Area wise distribution of knowledge scores score of respondents, Paschim Medinipur (urban) 2018   **[n=400]**

Area	Knowledge Area	Max possible score	Mean	Mean%	SD
1	Transmission of disease	4	2.71	67.75	1.06
2	Sign, symptoms and diagnosis	4	2.31	57.75	0.898
3	Prevention and control	3	2.29	76.33	0.828
4	Treatment	4	1.55	38.75	1.1
	Total	15	8.86		

The Table 4 shows that highest mean percentage (76.33%) knowledge regarding prevention and control, followed by transmission of dengue (67.75%), signs, symptoms and diagnosis (57.75%), whereas least mean percentage knowledge regarding treatment of dengue.

Table 5 - Mean, median and standard deviation of Stated Practice score of respondents, Paschim Medinipur (urban) 2018   **[n=400]**

Variable	Range of Score	Median	Mean	SD
Stated Practice Score	3-15	9	8.78	2.29
Score: Maximum - 15, Minimum - 0				

The table 5 shows that practice score regarding control and prevention, mean was 8.78, median 9, range 3-15, and standard deviation was 2.29, whereas maximum possible knowledge score was 15 and minimum possible knowledge score was 0.

Table 6 – Distribution of the respondents according to level of Stated Practice score of respondents, Paschim Medinipur (urban) 2018   **[n=400]**

Level of Stated Practice	Frequency	Percentage
<Median	181	45.25
>=Median	219	54.75

The table 6 depicts that 219 (54.75%) percent respondents had practice score which is equal or greater than its median score value, and 181 (45.25%) had less than median practice score

Table 7 - Area wise distribution of Practice scores score of respondents, Paschim Medinipur (urban) 2018 [n=400]

Area	Practice Area	Max score	Mean	Mean%	SD
1	Personal Protection	5	2.63	52.6	1.19
2	Environmental control and source reduction	4	2.36	59	1.03
3	Service Provider	6	3.78	63	1.27
	Total Score	15	8.78		

The Table 7 shows that highest mean percentage (63%) practice score regarding service provider, followed by environmental control and source reduction (59%), (52.60%), whereas least mean percentage of practice score regarding personal protection of dengue.

Table 8: Association between knowledge score regarding control and prevention of Dengue of respondents with selected variables Paschim Medinipur (urban) 2018   **[n=400]**

Selected demographic	Knowledge Score		df	χ^2	Remark
Variable	<Median	>=Median			
< median age	81	115	1	3.38	NS
>= median age	103	101			
Male gender	79	112	1	3.166	NS
Female gender	105	104			
Education					
Illiterate	27	22	7	15.58	S*
Primary school	36	28			
Mid school completion	28	34			
High School	30	33			
Higher secondary school	41	43			
post high school diploma	0	2			
Bachelor's degree	18	47			
Post-graduation	4	7			
Occupation					
Agriculture	4	9	5	10.87	NS
Service	27	52			
Business	38	49			
Unemployed	18	24			
Housewife	79	66			
Others	18	16			
Income					
<median family income	93	98	1	1.06	NS

>=median family income	91	118			
S*=Significant p<0.05, S**=highly significant p<0.001, NS= Not Significant p> 0.05.					

The table 8 showed that chi-square value of knowledge score with socio demographic variable like education (chi-square value =9.07) is statically associated. It indicated statistically significant association between knowledge score and education variable (below 0.05 level of significance). The study also shows that there is no statistically association between knowledge score with socio-demographic variable like age, gender, religion, occupation and monthly income.

Table 9: Association between knowledge score regarding control and prevention of Dengue of respondents with selected variables Paschim Medinipur (urban) 2018   **[n=400]**

Selected demographic Variable	Stated Practice Score		df	χ2	Remark
	<Median	>=Median			
<median age	82	114	1	1.8	NS
>=median age	99	105			
Male gender	83	108	1	0.47	NS
Female gender	98	111			
Education					
Illiterate	26	23	7	10.92	NS
Primary school	35	29			
Mid school completion	31	31			
High School	29	34			
Higher secondary school	35	49			
post high school diploma	0	2			
Bachelor's degree	21	44			
Post-graduation	4	7			
Occupation					
Agriculture	5	8		7.34	NS
Service	28	51			
Business	41	46	5		
Unemployed	20	22			
Housewife	75	70			
Others	12	22			
Monthly family income					
<median family income	98	93	1	5.417	S*
>=median family income	83	126			
S*=Significant p<0.05, S**=highly significant p<0.001, NS= Not Significant p> 0.05.					

The Table 9 above indicated chi square at df (1) for age is 1.8, df (1) for gender(df=1) is 0.736 and, for Religion is 4.356 (df=2),Education status($\chi2$=10.92 ,df=7) ,occupation ($\chi2$=7.34,df=5) chi-square of all these variables are less than table values, this indicates that there is no association between practice scores and selected socio demographic variable regarding prevention of dengue fever at 0.05 level of significance. Moreover, socio-economic variable like income is statically associated (chi-square value = 5.41, df=1) with the practice score, at a level of 0.05 level of significance.

Table 10: Correlation between Knowledge score and Practice score on Dengue prevention and control in Paschim Medinipur, 2018   **(n = 400)**

Area	Pearson Correlation (r)	Significance	Remark
Paschim Medinipur (Urban)	0.634	S**	Positive correlation

The Table 10 above revealed that there is positive correlation between knowledge and practice score (r=0.634) in Paschim Medinipur.

A comparison of two municipalities (not in study objectives)
Table 11: Mean difference of knowledge score by municipalities of Paschim Medinipur ,2018

Municipality	Mean	Mean difference	n	t value	Remark
Ghatal	9.14	0.56	200	2.289	S**
Khargapur	8.58		200		
S*=Significant p<0.05, S**=highly significant p<0.001, NS= Not Significant p> 0.05.					

The table -11 showed that mean knowledge score of Ghatal Municipality and Khargapur Municipality are respectively 9.14 & 8.58, mean difference 0.56. Mean difference of knowledge score in Ghatal and Khargapur municipality is statically significant (t =2.289, df=398) at a level of 0.05 level of significance

Table 12: Area wise comparison of knowledge scores by Municipalities of Paschim Medinipur 2018

Area	Knowledge Area	Max score	Mean	Mean%	SD
	Khargapur Municipality (n = 200)				
1	Transmission of disease	4	2.67	65.75	1.12
2	Sign, symptoms and diagnosis	4	2.28	57	0.91
3	Prevention and control	3	2.31	77	0.85
4	Treatment	4	1.31	32.75	1.15
	Total	15	8.58		
	Ghatal Municipality (n = 200)				
1	Transmission of disease	4	2.75	68.75	1
2	Sign, symptoms and diagnosis	4	2.34	58.5	0.88
3	Prevention and control	3	2.26	75.33	0.8
4	Treatment	4	1.79	44.75	1
	Total	15	9.14		

The12 shows area wise knowledge score in both Khargapur and Ghatal Municipality. In area of transmission of disease, mean percentage of knowledge score are respectively 65.75% and 2.27 %, SD showing the result of 1.12 and 1.

Mean percent of knowledge score regarding sign, symptoms and diagnosis in Khargapur municipality is 57%, and its value in Ghatal municipality is 58.5%, SD of this area shows 0.91%&0.88

Mean percent of knowledge score regarding Prevention and control in Khargapur municipality is 77%, and its value in Ghatal municipality is 75.33, SD of this shows respectively 0.85 &0.8

Mean percent of knowledge score regarding Treatment in Khargapur municipality is 32.75%, and its value in Ghatal municipality is 44.75%, SD of this shows respectively 1.15 & 1.

Table 13: Mean difference of practice score by municipalities of Paschim Medinipur ,2018

Municipality	Mean	Mean difference	n	t value	Remark
Ghatal	8.95	0.345	200	1.5	NS
Khargapur	8.6		200		
S*=Significant p<0.05, S**=highly significant p<0.001, NS= Not Significant p> 0.05.					

The Table 13 shows the mean difference of practice score in Ghatal and Khargapur municipality is 0.345, but it is not statistically associated with 0.05 level of significance.

DISCUSSION
Knowledge related
In the study knowledge score regarding control and prevention of dengue shows mean value of 8.86, mean percentage value of 59.

Similar results were seen found in a study conducted by Monika Paul R.M at Bangalore (2006), where mean knowledge score of women regarding prevention of dengue fever was only 17.66(44.2%) with standard deviation of 6.9. [23]

In the present study, 54% respondents showing equal or greater than median knowledge score.

In a similar study conducted in Malaysia (2011) by Cho Naing et al, shows similar results in which 56% had good knowledge and 44% had poor knowledge [24]

Practice related
In the present study mean practice score of Paschim district regarding control and prevention of dengue is 8.78, mean percentage of 58.53. The findings reveal that 45.25% have practice score lower than its median value, and 44.75% having practice score value equal or greater than its median value

In a similar study conducted at Belgaum, Karnataka (2014) the study shows mean practice score 5.39 and standard deviation 1.32 & mean percentage value of 52.9.[25]

In a similar study conducted practice of DF prevention by Makornkan et al (2015) in Thailand revealed that 2.5 % low practice on prevention of dengue, 38.4 % moderate practice, 59.1 % good practice. [26]

Association between knowledge with selected demographic variables
In the present study knowledge is associated with socio-demographic variable like education. High level of education reflects better knowledge regarding control and prevention of dengue.

Similar result found in a study conducted by Madihasyed et al (2010) where education is associated with knowledge(p=0.0004), it also concluded that high level of education shows better knowledge on dengue control and prevention. [27]

In the present study, knowledge score is not associated with socio-demographic variable like age, gender, marital status, occupation and monthly family income.

Similar study found in MegnathDhimal et al, where it revealed that age (0.963) gender (0.189)), income (0.867) is not associated with knowledge on dengue at 0.05 level of significance. [28]

A study conducted by Justin Stoler et al occupation has no association with the knowledge on dengue (p=0.63) [29]

Association with socio-demographic variable with stated practice

In the present study practice is associated with monthly family income at 0.05 level of significance. However, present study practice is not associated with gender, education, age, occupation at a significance level of 0.05.

Similar study conducted in Karachi by Madihasyed et al (2010), the author concluded that better socio-economic status reflected better practice on knowledge and prevention of dengue. [30]

In a similar study conducted by Megnath Dhimal et al, where it shows that practice has no association with gender (p=0.109) and age (0.561) variables [31]

Madihasyed et al (2010) in Karachi conducted a similar KAP study where the result shows practice is not associated (p>0.05) with occupation [32]

Tan Kok et al (2014) conducted a study on dengue, where the result shows that occupation is not associated (p=0.224) with the practice [33]

Association between Knowledge and Practice Variable

In the present study, statically analysis shows that there is positive correlation between practice and variable at 0.001 level of significance.

Similar study conducted by Supatcharee Makornkan et al (2015), there was a positive correlation (r=0.283) between knowledge and practice variable. [33]

CONCLUSION

- The study shows that knowledge is associated with education, but there is no association with age, gender, income, occupation
- There is also association with practice and monthly family income, but it shows no association with age, gender, education, occupation
- Practice has positive correlation with knowledge variable.

LIMITATIONS OF THE STUDY

1. This study represents only the urban population, so it compromises the generalization of population
2. For the study, time was limited with its volume.
3. The practice is stated one, which may defer from actual in practice
4. As per this study is done according to descriptive aspect, it compromises with qualitative part of further aspect.

RECOMMENDATIONS

1. More awareness programme on control and prevention of dengue should be conducted in regular manner for the urban community
2. Monitoring and supportive supervision to the community by the frontline workers is necessary to improve the positive practices.
3. Similar study including the qualitative aspects should be conducted in future.

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