

Original Research Article

Descriptive study on knowledge, attitude and practice regarding dengue fever and its vector control in Aligarh

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ABSTRACT

Background: In the past decade, there was a substantial increase in dengue burden on health services and economy of the nation. UP is endemic to dengue fever (DF) with cases being reported throughout the year.

Methods: Between February 2022 and May 2022, an epidemiological survey was conducted in 192 households (HHs) randomly selected from all field practice areas affiliated with urban health training centre (UHTC) and rural health training centre (RHTC) of the department of community medicine, Jawaharlal Nehru medical college, Aligarh. Knowledge, attitude, and practice (KAP) were assessed by means of a pre-tested and structured questionnaire.

Results: As per Bloom's cut-off criteria, it was identified that about 85.9% of the participants had poor level of knowledge, 83.3% had neutral attitude and 50.5% had poor level of practice regarding DF and its vector control.

Conclusions: There was a lack of in-depth knowledge regarding DF and its vector control along with poor preventive practices against DF in the study participants. This observation revealed that health education intervention is necessary to enhance KAP regarding dengue prevention and vector control in Aligarh community.

Keywords: Knowledge, Attitude, Practice, DF, Aligarh

INTRODUCTION

In the past decade, there was a substantial increase in dengue burden on health services and economy of the nation. Dengue is a major public health illness that is preventable with active community participation in vector control. Knowledge on dengue is the understanding of a definite phenomenon that focuses on transmission, symptoms, and ways of prevention of this illness. Attitude towards dengue refers to the organization of thinking around an approach that predisposes an individual to act in some specific way favouring the prevention of this disease. Practices against DF are a group of actions that trigger a definite outcome in health such as prevention of mosquito bites and reduction in vector breeding sites. For good practice among the members of the community,

there should be an adequate level of knowledge and attitude regarding the disease. Lack of knowledge regarding various aspects of this disease and its vector along with inadequate utilization of health services act as barriers to successful control and prevention of dengue in India. Several factors such as a large population, lack of education, and poverty can hinder people from adopting effective vector control measures. The practices of using stored water and improper garbage disposal are very common in India, especially in rural areas. These practices along with water logging due to rainfall can cause increased breeding of vector. Knowledge and preventive practice regarding dengue are not sufficient in Indian population. Hence, there is a need to provide more understanding of this disease in terms of its symptoms, transmission, vector behaviour and prevention strategies.

Uttar Pradesh is endemic to DF with cases being reported throughout the year. From July to November, there is an upsurge of dengue cases. Generally, dengue is considered as a disease of high-density tropical urban areas; however, dengue transmission occurs equally in both rural and urban areas in this state.¹ The increasing incidence of DF and the lack of relevant studies on the KAP of Aligarh community regarding DF prompted us to conduct the present study. The objective of this study is to ascertain the KAP of adult population in Aligarh, India, regarding DF and its vector control.

METHODS

Study area

The study was conducted in all field practice areas such as Firdous Nagar, Nagla Qila, Patwari Nagla, Bada Jawan, Chotta Jawan, Sumera, Garhia Bhojpur, Jawan Sikandarpur and Tejpur affiliated with health training centres of the department of community medicine, Jawaharlal Nehru medical college, Aligarh. This district is situated in Western Uttar Pradesh about 133 km southeast of Delhi on the Delhi Kolkata railway line and Grand Trunk Road. Aligarh experiences maximum temperature reaches up to 47°C in summer while the minimum temperature is about 3-5 °C in winter.

Inclusion criteria

HHs members of age 18-65 years and registered non rental HHs in RHTC and UHTC were included in study.

Exclusion criteria

HHs residing in a rental house, not willing for the study and HH member with any serious illness were excluded.

Sample size

This study was done as a pre-test of community based interventional study on KAP of DF and its vector control. With an assumption of 50% baseline knowledge and a change of at least 10% after intervention, the minimum sample was 168 after adding 5% non-response and 5% loss to follow up.²

Field based data collection

A HH survey was carried out between February 2022 and May 2022 using a pre-tested and structured questionnaire translated into local language. Head of the family or any adult family member above 18 years of age available at home during the survey was interviewed following informed consent. The questionnaire was divided into various sections covering sociodemographic information about the respondents, KAP regarding dengue prevention and vector control. Overall, data was obtained from 192 HHs.

Data analysis

The data collected from the survey were analysed using IBM SPSS version 26. Microsoft office home and student 2019 was used to draw graphs and charts wherever appropriate.

KAP score

Bloom's cut-off criteria were used to assess the scores.³ The total knowledge score was divided into good, moderate and poor grade based on this cut-off. The maximum knowledge score was 20 and the minimum score was zero. According to Bloom's cut-off, 80-100% of the total score was termed as good knowledge (16 or above), 60-79% of the total score was termed as moderate knowledge (12-15) and less than 60% of the total score was termed as poor knowledge (less than 12). Similarly, attitude with a maximum score of 60 and a minimum score of 12 was termed as positive attitude (48 or above), neutral attitude (36-47) and negative attitude (less than 36). Practice score with a maximum score of 12 and a minimum score of zero was termed as good practice (9.6 or above), moderate practice (7.2-9.5) and poor practice (less than 7.2).

RESULTS

Study population largely comprised of individuals in 18-35 years age group 102 (53.1%) with females 120 (62.5%) more than males 72 (37.5%). Most of the participants from rural area 123 (64.1%) and 70 (36.5%) participants had no formal education. Around 60% participants unemployed and nearly half of participants belonged to lower middle-class families (Table 1).

Dengue related knowledge

Table 2 and 3 shows that 37.5% of participants recognised DF as a disease, 45.8% knew about the transmission and 15.6% of participants knew the initial symptoms. More than half of the participants were aware of the recurrence and fatality of DF. It was also noticed that 31.8% of participants knew about the biting behaviour, 18.2% were aware of the breeding place and a few knew the name of the vector. About 64.5% of participants knew that dengue could be prevented; however, only a few participants had awareness regarding larvivores fish and insecticides.

Dengue related attitude

Table 4 and 5 shows that 60.9% of participants agreed that a healthy person could also contract this disease, 51.6% agreed that there was an equal risk of dengue infection for all family members and 85.9% were in view of seeking immediate treatment for high fever. The majority of participants had an attitude of using some form of preventive measures against mosquito bites and nearly 3/4th of participants considered dengue prevention as a collective responsibility. It was also noted that most

participants were against leaving any water collection sources outside their houses. About 66.1% of participants agreed to the need of checking the mosquito breeding sources; however, 14.1% of participants considered this as a wasted effort. More than 75% of participants had an attitude of granting permission for insecticide spraying inside their houses and less than 50% of participants supported levying a fine for the presence of larvae in and around their houses.

Dengue related practice

Table 6 shows that more than half of the participants did not listen to dengue awareness programs, 93.2% of

participants used some form of personal protective measure, 70.3% used these measures daily and 46.4% of participants used more than one personal protective measure. About 70.8% of participants practiced wearing fully covered clothes during day time, 28.6% of participants used light-coloured mosquito nets, and 18.8% of participants used neem smoke to repel mosquitoes. Most participants practiced the use of cover for water containers and cleaned these containers at least once a week. It was also noted that 88% of participants emptied water from cooler and tray behind the fridge every week, 77.6% of participants practiced proper disposal of house waste and 16.1% of participants practiced pouring oil in stagnant water to prevent larval growth.

Table 1: Socio-demographic profile of the study population (n=192).

Distribution of respondents	No. of respondent	Percentage (%)
Age distribution (in years)		
18-35	102	53.1
36-50	61	31.8
51-65	29	15.1
Gender distribution		
Male	72	37.5
Female	120	62.5
Area of residence		
Urban	69	35.9
Rural	123	64.1
Type of family		
Extended	96	50.0
Nuclear	96	50.0
Educational status		
Illiterate	70	36.5
Primary (up to 5 th)	25	13.0
Middle (6 th to 8 th)	37	19.3
Secondary (9 th to 12 th)	43	22.4
Graduate and above	17	8.9
Occupation		
Not working	113	58.9
Unskilled	24	12.5
Semi-skilled	46	24.0
Skilled	8	4.2
Professional	1	0.5
Socioeconomic class (Modified BG Prasad classification, May 2021)		
Upper class	2	1.0
Upper middle	14	7.3
Middle	34	17.7
Lower middle	91	47.4
Lower	51	26.6
Type of housing		
Pucca	163	84.9
Semi-pucca	29	15.1

Table 2: Knowledge on DF and its prevention.

Variables	Response	N	Percentage (%)
Do you know what is dengue?	It is a disease	72	37.5
	It is a mosquito	46	24.0
	Don't know	1	0.5
	Any other	73	38.0

Continued.

Variables	Response	N	Percentage (%)
How is it transmitted?	Through the bite of a mosquito	88	45.8
	Don't know	17	8.9
	Any other	87	45.3
Can dengue be transmitted by direct contact with a patient?	Yes	64	33.3
	No	83	43.2
	Don't know	45	23.4
What are the initial symptoms of dengue?	High grade fever, headache, joint pain, pain behind the eye, vomiting, etc	30	15.6
	Fever, cough, loose stool, body pain, etc	21	10.9
	Fever, nausea, running nose, eye pain, etc	55	28.6
	Don't know	86	44.8
You can get dengue multiple times	Yes	120	62.5
	No	36	18.8
	Don't know	36	18.8
Dengue can kill you	Yes	150	78.1
	No	22	11.5
	Don't know	20	10.4
Which test is used to confirm dengue?	Blood test	82	42.7
	Urine test	1	0.5
	Any other	41	21.4
	Don't know	68	35.4
How can it be prevented?	By preventing mosquitoes from laying eggs and biting us	122	63.5
	Vaccination	2	1.0
	It cannot be prevented	12	6.3
	Don't know	56	29.2
Placing unused containers upside down and covering water storage containers can prevent mosquitoes from laying eggs.	Yes	164	85.4
	No	18	9.4
	Don't know	10	5.2

Table 3: Knowledge on vector and its control.

Variables	Response	N	Percentage (%)
Can all mosquitoes transmit dengue?	Yes	62	32.3
	No	115	59.9
	Don't know	15	7.8
Have you ever heard of Aedes mosquitoes?	Yes	7	3.6
	No	185	96.4
During which time dengue causing mosquito bites?	Day time	61	31.8
	Night time	49	25.5
	Anytime	56	29.2
	Don't know	26	13.5
During which season these mosquitoes are abundant?	Rainy and post-rainy season	100	52.1
	Summer season	58	30.2
	Any other	30	15.6
	Don't know	4	2.1
Where does dengue causing mosquitoes commonly lay their eggs?	Stagnant dirty water	85	44.3
	Stagnant clean water	35	18.2
	Any other	34	17.7
	Don't know	38	19.8
Curtains/calendars/corners of houses/behind photo frames/ stores are hiding places for mosquitoes.	Yes	152	79.2
	No	35	18.2
	Don't know	5	2.6
Do you know that larvivorous fish like gambusia/ guppy is used for controlling mosquito larvae?	Yes	8	4.2
	No	184	95.8

Continued.

Variables	Response	N	Percentage (%)
Pouring chemicals in standing water can kill mosquito larvae.	Yes	180	93.8
	No	7	3.6
	Don't know	5	2.6
Do you know that a chemical named abate is poured into standing water to kill mosquito larvae?	Yes	2	1.0
	No	190	99.0
Do you know that a chemical named pyrethrin is sprayed on walls of houses to kill mosquitoes?	Yes	1	0.5
	No	191	99.5
Do you know that a chemical called malathion is used for fogging to control mosquitoes?	Yes	4	2.1
	No	188	97.9

Table 4: Attitude towards DF and prevention.

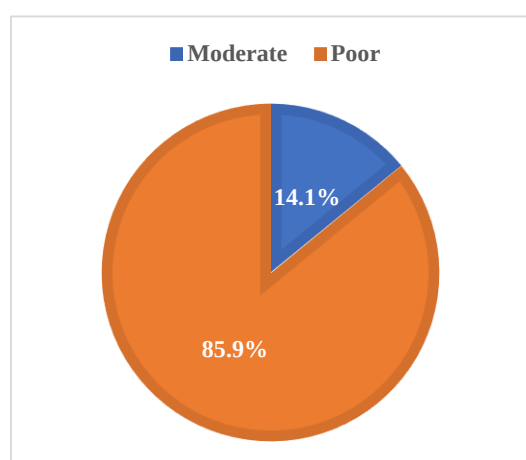
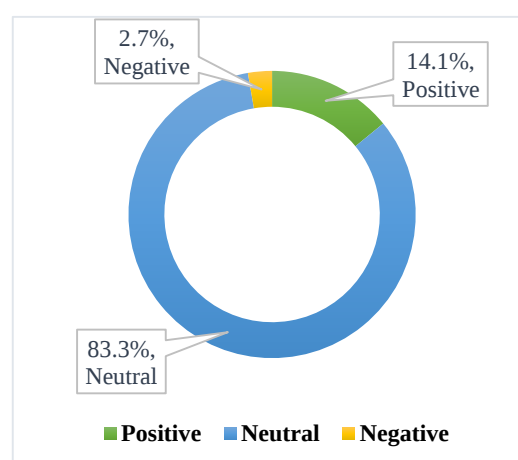
Variables	Response	N	Percentage (%)
A strong and healthy person can also get dengue infection.	Strongly disagree	2	1.0
	Disagree	38	19.8
	Neutral	21	10.9
	Agree	117	60.9
	Strongly agree	14	7.3
Everyone in my family has equal risk of infection with dengue.	Strongly disagree	1	0.5
	Disagree	48	25.0
	Neutral	30	15.6
	Agree	99	51.6
	Strongly agree	14	7.3
I should take my family member to the hospital immediately if he/she has a high fever.	Strongly disagree	0	0
	Disagree	10	5.2
	Neutral	17	8.9
	Agree	130	67.7
	Strongly agree	35	18.2
If I am infected with dengue, I should take proper rest and plenty of oral fluids like water/milk/soup	Strongly disagree	0	0
	Disagree	13	6.8
	Neutral	37	19.3
	Agree	138	71.9
	Strongly agree	4	2.1
I should follow some preventive measures to stay away from mosquito bites.	Strongly disagree	0	0
	Disagree	1	0.5
	Neutral	13	6.8
	Agree	170	88.5
	Strongly agree	8	4.2
Prevention of dengue is the responsibility of health workers and all members of the community	Strongly disagree	0	0
	Disagree	25	13.0
	Neutral	31	16.1
	Agree	127	66.1
	Strongly agree	9	4.7
Dengue patients should sleep in mosquito nets to prevent the spread of dengue	Strongly disagree	1	0.5
	Disagree	9	4.7
	Neutral	22	11.5
	Agree	155	80.7
	Strongly agree	5	2.6
I should not leave open bottles/broken utensils/tires outside my house.	Strongly disagree	0	0
	Disagree	1	0.5
	Neutral	5	2.6
	Agree	182	94.8
	Strongly agree	4	2.1

Table 5: Attitude towards vector and its control.

Variables	Response	N	Percentage (%)
I should check for the presence of mosquito larvae in cooler/ tray behind the fridge or any other water collection in and around my house.	Strongly disagree	0	0
	Disagree	21	10.9
	Neutral	37	19.3
	Agree	127	66.1
	Strongly agree	7	3.6
Checking and removing mosquito and larvae sources are not a complete waste of time	Strongly disagree	0	0
	Disagree	27	14.1
	Neutral	45	23.4
	Agree	117	60.9
	Strongly agree	3	1.6
I should not turn away spray workers whenever they come to my house for spraying	Strongly disagree	0	0
	Disagree	9	4.7
	Neutral	36	18.8
	Agree	135	70.3
	Strongly agree	12	6.3
Fines should be imposed if Aedes larva is present in and around my house on inspection by health workers	Strongly disagree	6	3.1
	Disagree	83	43.2
	Neutral	22	11.5
	Agree	78	40.6
	Strongly agree	3	1.6

Table 6: Practice regarding dengue prevention and vector control, (n=192).

Variables	N	Percentage (%)
Listen to dengue awareness programs on television/radio or mobile.	82	42.7
Use personal protective measures to avoid mosquito bites.	179	93.2
Use these personal protective measures daily.	135	70.3
Use multiple personal protective measures.	89	46.4
Use a light-coloured mosquito net.	55	28.6
Wear fully covered clothes during day.	136	70.8
Burn neem leaves to repel mosquitoes.	36	18.8
Dispose waste properly	149	77.6
Cover water storage containers.	191	99.5
Clean water containers at least once a week.	183	95.3
Empty water from cooler and tray behind the fridge at least once a week.	169	88.0
Pour any oil into standing water.	31	16.1

**Figure 1: Knowledge grade of the participants.****Figure 2: Attitude grade of participants.**

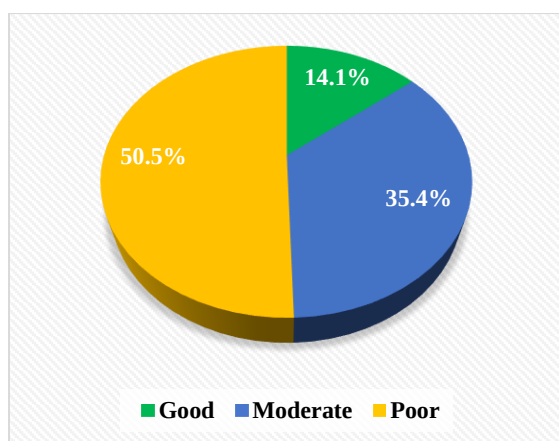


Figure 3: Practice grade of participants.

DISCUSSION

In this study, the main source of information regarding dengue was from family, friends and relatives (38%), probably due to higher community interactions in the rural areas. Similarly, a study from Bangladesh identified that 26.8% of participants responded their source as friends and family.⁴ About 37.5% of participants identified dengue to be a disease, comparable to a study from Malaysia.⁵ Most participants considered mosquitoes as a nuisance in their locality and around 46% of participants knew that mosquitoes transmit DF similar to the finding from Delhi.⁶ Around 43% of participants knew that DF will not be transmitted by direct contact. A similar result was reported from Nepal (44%).⁷

Only 15.6% of participants rightly mentioned the initial symptoms of dengue. This low response could be attributed to less prevalence of DF in the study population comparable to a study from Chandigarh (13.75%).⁸ About 62.5% of participants identified that a person could contract dengue infection more than once, similar to the findings from Yemen (59%).⁹ Most of the participants had no previous experience with DF and probably due to the apprehension of this disease, 78.1% identified dengue to be fatal. This result was consistent with a study from Kerala (74%).¹⁰ Around 65% of participants knew that dengue could be prevented comparable to a study from Nepal (71.9%).¹¹

About 85.4% of participants responded that covering water containers or turning the containers upside down could prevent mosquito breeding. This was consistent with a study conducted in China (92.7%).¹² Most of the participants had the misconception that the term “dengue” itself denotes the name of the vector. Hence, only 3.6% of participants were aware of *Aedes* mosquitoes. This response was similar to the findings of studies from Delhi (3.7%).^{6,13}

It was observed that only 31.8% of participants identified the vector to be a day-biter, probably due to less frequency of mosquito bites during day time. Similarly, a

study from Brasilia found that 30.8% of their participants identified the vector to bite during day.¹⁴ Several other studies reported inadequate knowledge regarding biting behaviour, notably from Indonesia.¹⁵ About 52.1% of participants identified an abundance of mosquitoes in rainy and post-rainy seasons. Like this result, more than half of the participants reported rainy season as the period of higher dengue transmission in a study from Srilanka.¹⁶

In the present study, only 18.2% of participants identified stagnant clean water as the breeding source of *Aedes*. This low response might be due to the linking of mosquito breeding to dirty water as there were more open drainages in the community. This finding was comparable to a study from Delhi (25.9%).⁶ While, a Sri Lankan study identified a high level of knowledge regarding the breeding source.¹⁶ Higher percentage of participants (93.8%) were aware that pouring chemicals into standing water could kill mosquito larvae. The respondents might have related this to the use of phenyl disinfectant which was commonly used for cleaning purposes in the study population. A similar response was obtained by study done from Indonesia.¹⁷

The overall dengue knowledge was identified to be poor which may be attributed to the fact that nearly half of the participants had an educational qualification of primary level or below and only a few respondents had a previous history of DF. This finding was similar to a study from Haryana in which they found 81% of their participants with poor, 18% with satisfactory and 1% with good knowledge scores.¹⁸ Similarly, Delhi study identified inadequate knowledge regarding vector breeding and biting habits. Studies from Chandigarh, Nepal and Indonesia also found the knowledge to be generally inadequate among their participants.^{7,8,15}

About 60.9% of participants agreed that a healthy person could also get dengue infection. Similar findings were reported from Yemen (62.1%) and Malaysia (53.3%).^{9,19} About 51.6% of participants agreed that there was an equal risk for all family members to get dengue infection comparable to a study from Venezuela.²⁰ Around 86% of participants preferred seeking immediate treatment for high fever similar to the findings of Kolkata (79.2%) and Malaysia (79%).^{21,22} About 92.7% of respondents had an attitude of following some form of preventive measures against mosquito bites. This finding was identical to a study done from Bangladesh, in which they found 89.7% of their participants with a similar response.²³

In the present study, 66.1% of participants agreed that dengue prevention should be a shared responsibility which was similar to the finding from Kolkata (61.8%).²¹ Around 83% of participants positively responded to the need of sleeping in mosquito nets to prevent the spread of DF. This was comparable to a study done in Yemen in which they found that 85.2% of participants favoured the use of bed nets for dengue prevention.⁹

Around 66% of participants agreed to the need of checking mosquito breeding sources. Malaysian study recorded similar findings in 60.5% of their participants.¹⁹ It was also found that 62.5% of participants did not consider checking larval sources as a waste of time. This was consistent with another similar Malaysian study.²²

About 70.3% participants agreed to permit insecticide spraying inside their house. Similarly, studies from Kolkata (79.2%) and Malaysia (86.2%) noted the same response.^{19,21} It was seen that only 42.2% of participants supported levying a fine for the presence of larvae in and around their houses. This unfavourable response might be due to the low-income status of the participants. Unlike the present findings, a study from Malaysia obtained favourable responses from 72.9%.²⁴

It was identified that 14.1% of participants had positive attitude towards DF and its vector control. Like the present findings, a study from Indonesia identified 10.1% of participants with a positive attitude and nearly 50% of participants with a neutral attitude.²⁵

Around 93% of participants used some personal protective measures like mosquito nets/repellents/coils, etc against mosquito bites, mostly due to the high burden of mosquitoes in their locality. Similarly, in Chandigarh more than 90% of their participants took some form of preventive measure against mosquito bites.⁸ About 70.3% of participants used these preventive measures daily. This finding was similar to a study from Kerala (95.2%).¹⁰ Light-colored mosquito nets were used by 28.6% of participants. Similar result was obtained in Rajasthan (24.3%).²⁶ Whereas a study by Nepal found that more than 90% of their participants practiced use of bed nets.¹¹

It was identified that 70.8% of participants used full-sleeve clothing during daytime, which was comparable to the findings from Nepal (61.4%).²⁷ Around 19% of participants had the practice of burning neem leaves to stay away from mosquitoes. Even though neem was easily available, a lack of knowledge regarding its effectiveness to repel mosquitoes restricted its usage by the participants. A study from Delhi found that 12.9% of their participants used neem leaves against mosquitoes.¹³ Interestingly, in the present study, we found a few participants utilizing the smoke of burned egg craters to repel mosquitoes.

We identified that 77.6% of participants practiced proper waste disposal through door-to-door collection, composting, landfilling, etc similar to a study from Malaysia.¹⁹ Almost everyone covered water storage containers comparable to studies from Nepal, Rajasthan and Kerala, in which they observed this practice in more than 80% of participants.^{10,11,26,27} Around 95% of participants cleaned the containers at least once a week. A similar study from Indonesia found that 91.8% cleaned water containers more than once a week.¹⁵

It was observed that 88.0% participants emptied water from cooler, tray behind fridge, etc at least once a week. This higher level of practice could be attributed to frequent home visits by ASHA workers to check the breeding sources of mosquitoes. Similar to the present finding, Telangana study found that 65% of participants checked for water collection in coolers and 77% of participants emptied unused containers.²⁸ Whereas a study from Rajasthan identified that most of their respondents neither checked coolers for mosquito breeding nor changed the water weekly.²⁹ Around 16% of participants poured oil into stagnant water to prevent larval growth. A similar result was obtained from Nepal in which 10.1% of participants had this practice.¹¹

Overall, 14.1% of participants had good practice regarding dengue prevention and vector control, comparable to studies from Indonesia (16.9%) and Uttar Pradesh (10.2%).^{25,30}

Limitations

The major limitation of this study is essentially small number of participants as it was a pre-test of community based interventional study on KAP regarding DF and its vector control.

CONCLUSION

In this study, it was found that more than 3/4th of the participants had poor knowledge, 83.3% had neutral attitude and 50.5% had poor level of practice regarding DF and its vector control. Hence, we recommend health education intervention to enhance KAP regarding dengue prevention and vector control in Aligarh community.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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