

Research Article

Knowledge, Attitudes, and Practices (KAP) of Rural Communities on Dengue & Evaluating the Most Effective IEC Method for Its Prevention and Control in Delhi

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A B S T R A C T

Background: *Aedes* mosquito prevalence in rural settings of Delhi is strongly related to the changing lifestyle and ongoing urbanisation in rural areas. Adequate awareness of dengue - its signs and symptoms help in curbing the disease and seeking early and appropriate medical assistance to save lives.

Methods: The study was conducted in rural areas of 3 zones namely Narela zone, Najafgarh zone and Civil Lines zone of the Municipal Corporation of Delhi. For assessing the most suitable Information Education & Communication (IEC) activity, the knowledge level of selected individuals was assessed using a semi-structured, self-administered questionnaire. It was followed by different IEC package materials. Based on the responses of villagers, the total score of each villager was calculated. If the mean score of individuals was more than 50% then the villager was marked as having average awareness.

Result: Around 72% of individuals lack awareness regarding *Aedes* mosquito breeding habitats and its role, being the vector agent for dengue fever. Fever was reported by 59% of the study population. Mosquito-repellent coils and mats were used by 33% of respondents. Almost all of them used it during nighttime. Awareness about symptoms of dengue fever improved from 26% of villagers in pre-IEC to 84% of villagers in the post-IEC survey through the chaupal meeting method of IEC as compared to other IEC methods.

Conclusion: This study can be an important source of baseline information. Based on the findings of this study, now MCD may focus on IEC campaigning through chaupal meetings with villagers to control the transmission of diseases in villages.

Keywords: Dengue Fever, IEC, Chaupal Meeting, Municipal Corporation of Delhi

Introduction

Dengue fever, which is transmitted by *Aedes* mosquitoes, is an important public health concern in India including Delhi and is being reported from urban as well as rural areas. The spread of *Aedes* mosquitoes in villages is associated with expanding rural water supply schemes, new construction projects, changing lifestyles and attitudes, increasing the use of disposable containers, etc. Information, Education and Communication (IEC) is a proven powerful tool for bringing social change and behavioural change. If people have proper knowledge about the biology of the *Aedes* mosquito vector that transmits the dengue virus as well as adequate awareness of the signs and symptoms of dengue fever, then it can help in curbing the disease and seeking early and appropriate medical support that may prevent morbidity and mortality. The present study was done with the objectives of understanding the knowledge, attitude and practices of the rural communities in relation to dengue prevention and control and finding out which is the most suitable IEC method of education with the intention of broadening its scope to cover the entire rural population of Delhi.

Materials and Methods

Study Design and Setting

The study was conducted during January–March 2023. The ethical clearance & approval for the study were obtained from the Municipal Corporation of Delhi (MCD).

The study was conducted in 3 rural zones namely Narela zone, Najafgarh zone and Civil Lines zone of MCD based on the questionnaire method. In each rural zone, the study was done in two different wards of that zone. The rural wards of Delhi were selected for this study because the IEC strategy is required to be strengthened for the prevention and control of dengue in these areas.

For further selecting wards for this study, the epidemiological profile of reported dengue cases of different wards of these municipal zones was obtained from the office of the Municipal Health Officer (MHO) for the years 2018–2022 along with the details like names and addresses of these patients. These reported dengue cases were verified from the different hospitals in Delhi. Based on it, two different wards of each rural municipal zone that had the maximum number of average dengue cases in the last 5 years were selected.

The sample size was calculated assuming that 50% population has knowledge with a 95% confidence level and 5% allowable error. After adding 10% for non-responses, the sample size in each ward became 106 and the total sample size in 6 wards, (2 per zone) of rural areas of Delhi, became 636. Hence a total of 660 participants for convenience

was included. 11 individuals were taken for the study by applying systemic random sampling from each randomly selected 10 different villages from each ward (11 X 10 X 6).

Questionnaire and Data Collection

The criteria to participate in this study were that volunteers must be 20 years of age or above and must have no record of any mental disturbance. Prior to administering the questionnaire, a study description written in simple easy to understand language was shared with consenting individuals. Upon reading if the individuals were willing to participate, they were asked to fill up a questionnaire. Questions related to Knowledge Attitude and Practice (KAP) were asked to all villagers individually to avoid any bias.

In the study data was collected on (a) demographic information (the age, education qualification, present occupation, marital status, family income and type of residence of the participants); (b) whether or not he/she, his/ her family members or neighbours had already suffered from dengue fever; (c) knowledge about dengue fever (symptoms, vectors, management of disease and its prevention); (d) attitude as well as practices of people towards dengue fever and (e) dengue fever preventive and control practices, i.e., methods used to reduce breeding sites and to reduce human mosquito contact (bed nets, repellents and mats). Participants were also asked about their sources of information on dengue fever.

For assessing the most suitable IEC activity, the pre-test knowledge levels of the selected individuals were assessed using a semi-structured, self-administered questionnaire regarding the signs/ symptoms of dengue fever and its prevention method. It was followed by an IEC package which included 1) handbill, 2) nukkad natak, 3) personal house-to-house communication, 4) chaupal meeting, and 5) munadi by megaphone. Different IEC packaging activities were carried out to different groups of persons (21 each X 5 groups x 6 wards) for a maximum duration of 30 minutes continuously for 3 days every week for 1 month. People were gathered again after 7 days, 15 days and one month for the post-test level of knowledge which was assessed by giving the same questionnaire for each group. Based on the response of villagers total score of each villager was calculated. If the mean score of individuals was more than 50% then the villager was marked as aware.

Statistical Analysis

Each question in the domains of knowledge, attitude and practice was scored. The scores in each domain were added to obtain a continuous composite score for that domain. The mean score in each domain was taken as the cut-off to define good knowledge, attitude and practice respectively. The demographic variables were then analysed further by using descriptive statistical measures (mean, frequency,

percentage as well as standard deviation). Categorical variables are expressed in proportions. The effectiveness of IEC was analysed by using z test and inferential statistics. The association between the level of knowledge and the selected demographic variables were subsequently assessed by the Chi-square test.

Results

The mean age of the study population was 43.3 years. The majority of the study participants belonged to the age group of 24–59 years ($n = 548$, 83.1%). Those aged 60 years and above constituted 16.9% ($n = 111$) of the population. More than half of the participants were females ($n = 190$, 66.7%). A good proportion of them ($n = 119$, 41.7%) were educated above 10th standard.

About 92% of the study population had 10th-class passing certificates and 10% had graduate degrees. 94% of villagers had access to piped water supply.

Around 72% of individuals were not aware of the causative agent of the disease. They scored above the mean score in the knowledge domain, only 16% of individuals mentioned virus as the causative agent of the disease and the rest of the individuals did not correctly mention the causative organism of the disease dengue. (Table 1)

Table 1. Awareness about causative agent of dengue

Gender	Participants Aware of Causative Agent (%)	Participants Unaware of Causative Agent (%)	Participants Who Did Not Mention Correctly (%)
Male	19.3	64.5	16.20
Female	13.6	78.9	7.50
Overall average	16.4	71.7	11.85

10% of the respondents were unaware of the signs and symptoms of dengue. Out of the rest of the study population, fever was reported by 59% of the study population and only 7% mentioned retro-orbital pain as a symptom. 24% of villagers shared multiple responses. (Table 2)

Death as a consequence of the disease was reported by 86 (13%) individuals. However, 515 (78%) respondents did not know about the fate of dengue. It was observed that more males knew about the fate of the disease as compared to females. Only 68% were familiar with one or more means of preventive measures. (Table 3)

About 81% of the respondents were unaware of the breeding places of mosquitoes. The findings did not vary

significantly with the literacy status. Variation of knowledge regarding the mode of transmission in relation to literacy status was statistically significant ($z = 2.42$, $p < 0.05$). (Table 4)

Table 2. Awareness about sign and symptoms of dengue

Gender	Fever (%)	Retroorbital Pain (%)	Multiple Response (%)	Participants Unaware of Sign/ Symptom (%)
Male	60.4	8.2	23.3	8.1
Female	58.6	5.1	25.1	11.2
Overall average	59.5	6.6	24.2	9.6

Table 3. Knowledge about fate of dengue illness

Gender	Death as Fate of Disease (%)	Participants Unaware of Fate of Disease (%)	Multiple Responses (%)
Male	14.8	77.3	7.9
Female	11.6	79.0	9.4
Overall average	13.2	78.1	8.6

Table 4. Awareness regarding dengue according to literacy status

Literacy Status	Breeding Place (%)	One or More Preventive Measures (%)	Biting Time of Dengue Mosquitoes (%)
Illiterate	76.9	65.2	9.9
Literate	85.5	71.8	12.8
Overall average	81.2	68.5	11.3

In this study, the transition of knowledge and attitude into practice was clearly observed. For example, more than 80% of the participants agreed that stagnant water in and around the houses is the source of breeding of mosquitoes and that controlling these breeding places of mosquitoes is an effective strategy to prevent dengue.

For the majority of villagers, the source of information regarding signs and symptoms of dengue fever was mass media (64%). Knowledge about its mode of transmission and prevention was obtained from other sources (21%) like family relatives, neighbours etc. Regarding information related to the aetiology of dengue infection, its vectors and facts of the ailment, 9% got the information from healthcare workers, and 3% of the respondents did not get any information from any of the available sources.

It is known that the *Aedes aegypti* mosquito typically bites during the daytime. In this study, a large number of villagers did not know the biting time of the mosquitoes. Nearly 11% of villagers knew the correct biting time of dengue mosquitoes. Mosquito mats and repellent coils

were used by 33% of villagers and almost all of them used it during night time. Other common practices, regarding the prevention and control of dengue fever like cleaning of houses, insecticide spray and control by other traditional methods prevalent among villagers are shown in (Table 5).

Regarding different methods of IEC, there was an immense improvement, particularly in awareness about symptoms of dengue fever from 26% of villagers in pre-IEC to 84% of villagers in post-IEC survey through village chaupal meetings as compared to other IEC methods, whereas the awareness increase by personal communication was 46%, by handbill distribution it was 10%, with nukkad natak it was 26%, and by munadi, it was 14%. (Table 6)

Table 5. Dengue control practices adopted by villager according to literacy status

Literacy status	Use of Mosquito Coil/ Liquid (%)	Cleaning of House (%)	Insecticide Spray (%)	Use of Bed Net (%)	Other Methods (%)
Illiterate	28.9	31.4	7.8	15.0	16.9
Literate	37.3	24.2	9.4	7.8	21.3
Overall average	33.1	27.8	8.6	11.4	19.1

Table 6. Pre and post awareness status about dengue prevention with different IEC strategies

Awareness status	Awareness before IEC (%)	Time interval (after)	Awareness after IEC (%)	Overall improvement (%)
Chaupal Meeting	26.1	7 days	34.3	58.2
		15 days	52.1	
		1 month	84.3	
House-to-House Awareness	24.8	7 days	31.3	46.0
		15 days	54.0	
		1 month	70.8	
Through Handbill	28.3	7 days	29.3	9.9
		15 days	32.6	
		1 month	38.1	
Through Nukkad Natak	21.6	7 days	28.3	26.2
		15 days	39.2	
		1 month	47.8	
Munadi	27.0	7 days	31.4	14.4
		15 days	38.0	
		1 month	41.4	

Discussion

No significant association of knowledge was found with sex, age or preliminary education level of the participants. This finding was similar to the results of a study done in Malaysia.¹ This can be explained by the fact that at the primary school education level, there is no content on dengue fever in Delhi and respondents obtained this information from some other sources (e.g., from mass media and interpersonal communication). However, a higher education level (secondary or senior secondary education) was associated with good practices among the villagers. Our findings are congruent with a similar study done in Thailand.²

Regarding knowledge of signs and symptoms of dengue fever, around 60% of respondents could enumerate one symptom (fever) and 24% could enumerate three symptoms (fever, joint pain and headache). Similar findings were observed in other studies.^{3,4,5} The possible explanation for less awareness among the residents could be due to less interpersonal communication of health workers with villagers and widespread health education messages by hoardings, newspapers and other mass media which were found to be less effective for the rural population. The insufficient knowledge of symptoms associated with DF among our study population means that this disease may easily be confused with other common causes of fever such as influenza, typhoid, etc., inviting delays for check-ups until complications develop as reported in a study from Jamaica.⁶

The present study revealed that 19% of the participants were unaware of the breeding places of the *Aedes* mosquito vector, whereas 20.2% were unaware of the same as per an earlier study.⁷ 3% of the respondents of the present study did not receive any information from any source about dengue fever. These are the people who do not have faith in the modern system of medicine. They still practise traditional methods for treating their illness, take treatment from village ojhas, believe in witchcraft, etc. This indicated that health workers in rural areas are not properly mobilising villagers during their educational campaigning programme.

In this study, people lacked sufficient knowledge of dengue vector mosquito bites in the daytime. They were taking precautionary measures against mosquito bites at night time and requested health workers for insecticide spray in dirty water. There is a requirement to make villagers aware of different preventive practices and to shrink this knowledge application gap.

The findings of our study showed that the present IEC activity regarding dengue fever transmission and its prevention in rural areas through handbills, munadi, and

advertisements in newspapers, TV etc. was poor and inadequate. In this study, chaupal meetings have come out to be the most effective method of health education as compared to other health education methods adopted by MCD in villages. Chaupal meeting is also a type of interpersonal communication method. In this meeting, the malaria health worker initially explained all things related to dengue fever prevention and control to all villagers present in this chaupal meeting/ group meeting. Then the chaupal leader (who is the most senior member of that village and who has some leadership skills) explained the things to all villagers/ chaupal members in his own local village language. As the chaupal leader was the senior most elderly person and he explained things to villagers in his local language, therefore generally his instructions suggestions and advice were followed by all villagers. Further after applying the chi-square test on the results of different IEC methods, it was found that IEC activity through chaupal meetings significantly improved the knowledge of villagers as compared to other IEC methods (observed value 10.25 as compared to tabulated value 9.4, sign level 0.05).

Conclusion

This study has provided important basic information that can be used as future reference or comparison. It can also help in identifying areas that can be targeted in subsequent future strategies. The knowledge obtained from this study may be used to monitor the effectiveness of dengue prevention and control activities performed by different health workers for the effective implementation of vector-borne disease control programmes. In addition, it can help in the allocation of resources for preventing dengue in the rural areas. This study elicited that chaupal meetings are a more effective IEC method in villages as compared to personal communication and other IEC methods. With the help of these meetings, the desired outcomes in the prevention and control of dengue transmission may be achieved. Based on the findings of this study, now MCD may focus on IEC campaigning through chaupal meetings/ group meetings with villagers to control the transmission of diseases in villages.

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