



Impact of community based awareness education about dengue by assessing knowledge and preventive practices in rural population

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ABSTRACT

Dengue a major international public health concern is a vector-borne viral infection caused due to bite of *Aedes aegypti* mosquito. To reduce human-mosquito contact or eliminate vector population efforts should be made. The knowledge gained through this investigation would help rural population to take certain preventive and control measures against dengue fever. It would also be helpful to guide policy makers and health authorities to plan, design and initiate initiatives, various programs and policies regarding prevention of dengue. To find out the impact of community-based awareness education about dengue by assessing knowledge and preventive practices in rural population. A Cross-sectional questionnaire-based study was done in rural population residing near the Datta Meghe Medical College, Wanadongri, Nagpur over a period of three months. Sample size of 166 participants; age more than 18 years residing in rural area were included in the study. Positive correlation in knowledge regarding dengue fever was found at post test among participants and information imparted; significant improvement was observed with respect to pretest taken. Questionnaire helped individuals to gain more knowledge regarding the disease and its prevention. This study concludes that the knowledge score of participants regarding dengue fever and invigilator increases at post test. Hence a better and healthy community can be achieved just by imparting simple doorstep knowledge.



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INTRODUCTION

Dengue is a viral infection, that is vector-borne, is caused by *Aedes aegypti* mosquito bite. It has been observed that almost all the ages and socioeconomic status people can get affected by Dengue, with an estimated 2.5 billion people living in endemic countries are at-risk and 50 to 100 million cases per year. It has been observed as a significant international public health concern. Dengue is mostly found in tropical and sub-tropical regions around the world, predominantly in urban and semi-urban areas and is a self-limiting disease. Outbreaks of Dengue happen

during the rainy season (Wu *et al.*, 2007).

Lack of effective mosquito control mechanisms, preventive measures and programmes in many countries like Asia, Africa and America represent a pandemic of Dengue. The reason could be due to urbanization, increased population and frequent air travel along with this greater abundance of disposable and non-degradable containers that can serve as Aedes production sites.

The Economic, political, technologic, ecologic and demographic changes have also sped up the spread of new microbial and previously known infectious disease (Gubler, 2004; Itrat *et al.*, 2008).

World Health Organization (WHO) has classified Dengue as a vital public health-related disease. Four serotypes of the virus are referred to as DV-1, DV-2, DV-3 and DV-4 belonging to the family of Flaviviridae (Gupta *et al.*, 2012). Epidemiologically and ecologically dengue infections are strongly associated with and related to human habits and activities (Yboa *et al.*, 2013).

In the year 1997, another classification was put forward that divided Dengue into an undifferentiated fever, dengue fever (DF) and Dengue hemorrhagic fever (DHF) (Wu *et al.*, 2007). Dengue illness presents with

1. High fever that could be continuous and lasting for 2-7 days.
2. Bleeding or hemorrhagic tendency (positive tourniquet test) petechiae or epistaxis.
3. Thrombocytopenia (platelet count <100x10⁹/l)
4. Evidence of plasma leakage which could be manifested by haemo-concentration (an increase in haematocrit 20% above average for age, sex and population) and
5. Pleural effusion and ascites (Yboa *et al.*, 2013).

People suffering from Dengue can recover within two weeks, but in severe infections bleeding from nose, gums or from underneath skin are seen, which can lead to immense bleeding and shock resulting in life-threatening consequences.

In Chennai (1780) first epidemic of clinical dengue-like illness was detected, while a first virological proved epidemic of Dengue occurred in Calcutta and Eastern Coast of India around 1963-1964 (Sarkar *et al.*, 1964; Chatterjee *et al.*, 1965; Carey *et al.*, 1966).

The first major extensive spread epidemics of dengue hemorrhagic fever/dengue shock syndrome occurred in India (1996) which involved areas around Delhi, Lucknow from where it had spread

to all over the country (Shah, 2004). WHO and Centers for Disease Control and Prevention have strongly recommended the implementation of community educational programmes, campaigns regarding reducing vector breeding sites to control and prevent dengue fever (Yboa *et al.*, 2013) effectively.

It has been observed through various researches that there is a considerable reduction in dengue vector breeding sites. It has been possible to accomplish this with the help of community education programmes and campaigns than through chemicals (Espinoza-Gomez, 2002).

Many studies have suggested that better knowledge and understanding of Dengue and dengue vector prevention practices among the general public can be one of the predictors of better methods of dengue control and prevention (Yboa *et al.*, 2013).

Other studies claim that population with higher knowledge on Dengue reported a significantly maximum use of preventive measures against Dengue than people with low knowledge (van Benthem *et al.*, 2002).

Recent outbreaks of Dengue, despite of the extensive efforts taken by the government against dengue fever in the province necessitated the development of this study.

The present study would help the rural population to gain knowledge about Dengue and help them to take specific preventive and control measures against dengue fever and also guide public administrators to plan, design, choose initiatives, programmes and policies relative for dengue prevention and control which could be used to address the ever-growing problems on dengue fever.

Aim and objectives

Aim

To find out the impact of community-based awareness education about Dengue by assessing knowledge and preventive practices in rural population.

Objectives

1. To measure the impact of community-based awareness education regarding Dengue.
2. To test the knowledge on Dengue, causation, place of breeding, time of bite and symptoms.
3. To test knowledge on dengue prevention.
4. To co-relate the knowledge of participants and verifier.

MATERIALS AND METHODS

A questionnaire-based cross-sectional study was carried out overpopulation residing in a rural area near the Datta Meghe Medical College, Wanadongri, Nagpur over three months. The Institutional Ethical Committee approved the study. Sample size of one-hundred and sixty-six (166) participants (Lwanga and Lemeshow, 1991) of more than eighteen (18) years partook the study. Participants had given written consent, and only those people were included while others were excluded.

Procedure

Data regarding the study was gathered using a validated questionnaire by visiting each participant's house. The questionnaire consisted part -A, to be filled by participant's and part -B to be filled by verifier with marks allotted to each question. Awareness regarding Dengue was imparted to participants orally, and a pamphlet was provided in the local language to each participant.

After seven days participant's house was revisited by the verifier, and the same questionnaire was given to check the improvement in the knowledge regarding dengue and sanitation improvement after those seven (7) days. Descriptive and inferential statistics were used for statistical analysis. Student 't' test was used for the study of results. Software used was of SPSS 22.0 version and Graph Pad Prism 6.0 version. $P < 0.05$ was considered as a level of significance.

RESULTS

Interpretation

18.07% population were of 18-29 years 41.5% population 30-39 years who were maximum, 21.6% participants of the age group of 40-49 years and 18.67% population belonged to 50-70 years of age respectively.

Interpretation

More than half [89 (53.61%)] among the cases were females, whereas [77 (46.38%)] were males.

Interpretation

Majority [112 (73.49%)] among the cases were literate as and [44(26.50%)] were illiterate.

Interpretation

Mean knowledge score of participants at pretest was 5.25 ± 2.21 , and at posttest, it was 12.15 ± 0.97 . After applying a participant's paired 't' test statistically significant difference was found mean knowledge score of participants at pre and post test ($t=41.70$, $p\text{-value}=0.0003$).

Mean gain in knowledge score of the participants was 6.89 ± 2.05 and, percentage gain was 106.66%.

Interpretation

Mean knowledge score of verifier at pretest was 2.68 ± 0.70 , and at post test, it was 3.49 ± 0.59 . After applying participant's paired t-test statistically significant difference was found mean knowledge score of verifier at pre and post test ($t=15.88$, $p\text{-value}=0.0001$). Mean gain in knowledge score of the participants was 0.81 ± 0.63 and percentage gain was 30.22%.

Interpretation

Positive correlation in knowledge regarding dengue fever was found at pretest among participants and verifier ($r=0.10$, $p\text{-value}=0.18$) and at posttest ($r=0.13$, $p\text{-value}=0.10$).

DISCUSSION

Knowledge and preventive practices regarding dengue infection among the rural village population near Datta Meghe Medical College, Wanadongri, Nagpur was evaluated in the present study over three months.

In the present study, 18.07% of the population were of age between 18 and 29 years, 41.5% of people were of age between 30 and 39, and they were maximum, 21.6% of participants were of age between 40 and 49 years and 18.67% of the population were of age between 50 and 70 years of age as shown in Table 1. More than half [89 (53.61%)] among the cases were females. There were [77 (46.38%)] males, as shown in Table 2. The majority [112 (73.49%)] among the cases were literate and [44(26.50%)] were illiterate, as shown in Table 3, respectively.

Results obtained from the present study demonstrates that after implementation of the knowledge and awareness regarding Dengue, causation, place of breeding, time of bite and symptoms related to dengue fever, participants gained more knowledge regarding the spread and prevention methods of Dengue.

Mean knowledge score of participants at pretest was 5.25 ± 2.21 , and at posttest, it became 12.15 ± 0.97 . Also, the mean gain in knowledge score of the participants was 6.89 ± 2.05 and percentage gain was 106.66% as depicted in Table 4.

Similarly, the mean knowledge score of verifier at pretest was 2.68 ± 0.70 , and at posttest, it became 3.49 ± 0.59 . Also, the mean gain in knowledge score of the verifier was 0.81 ± 0.63 and percentage gain was 30.22% as depicted in Table 5.

Table 1: Participants distribution according to age

Age (yrs)	Participants	Percentage (%)
18-29 yrs	30	18.07
30-39 yrs	69	41.5
40-49 yrs	36	21.6
50-70 yrs	31	18.67
Total	166	100
Mean \pm SD	34.43 \pm 15.41(18-70 yrs)	

Table 2: Gender wise distribution of Participants

Gender	No of participants	Percentage (%)
Male	77	46.38
Female	89	53.61
Total	166	100

Table 3: Education wise distribution of Participants

Education	No of participants	Percentage (%)
Literate	122	73.49
Illiterate	44	26.50
Total	166	100

Table 4: Comparison between pre test and post test knowledge score of participants

	Mean	N	Std. Deviation	Std. Error Mean	t-value	p-value	% gain
Pre Test	5.25	166	2.21	0.17	41.70	0.0003	106.66%
Post Test	12.15	166	0.97	0.07		S,p<0.05	6.89 \pm 2.05

Table 5: Comparison between pre test and post test knowledge score of invigilator

	Mean	N	Std. Deviation	Std. Error Mean	t-value	p-value	% gain
Pre Test	2.68	166	0.60	0.05	15.88	0.0001	30.22%
Post Test	3.49	166	0.49	0.04		S,p<0.05	0.81 \pm 0.63

Table 6: Correlation in knowledge score of participants and invigilator

		Mean	Std. Deviation	N	Correlation 'r'	p-value
Pre Test	Participants	5.25	2.21	166	0.10	0.18
	Invigilator	2.68	0.70	166		
Post Test	Participants	12.15	0.97	166	0.13	0.10
	Invigilator	3.49	0.59	166		

Though many participants knew that Dengue was a contagious disease and spread via mosquito, several misconceptions regarding dengue fever were identified while conducting the present study (Gonçalves *et al.*, 2004).

As per WHO guidelines on Dengue, the *Aedes aegypti* mosquito typically bites during the day. A considerable proportion of respondents regarded *Anopheles* mosquito (malarial vector) and *Aedes Aegypti* to have similar characteristics and habitat along with their transmission patterns. This is most likely due to the high prevalence of malaria caused by *Anopheles* mosquito in developing countries, the knowledge about which is generalized to the dengue mosquito by the common person.

In the present study, it was found that though the significant population of study have heard about dengue fever somewhere, still they possessed deficiencies in their knowledge about the disease which was observed while taking pretest for participant and verifier as shown in Table 4 and Table 5.

Similar findings were also observed in studies of South Asian region (Chakravarti and Kumaria, 2005; Pai *et al.*, 2005; Shuaib *et al.*, 2010), studies done by Syed M and Jain S (Syed *et al.*, 2010; Jain and Sharma, 2017). Majority of people believed that Dengue was a contagious disease and an equal number thought it was being transmitted from one person-to-another.

Participants of the present study had adequate knowledge regarding dengue symptoms like bleeding and rashes, which were also reported by other studies done in India and Brazil (Claro *et al.*, 2006). Research carried out by (van Benthem *et al.*, 2002) in Northern Thailand reflected that symptoms like rash or bleeding in dengue infection are more common than any other febrile illnesses indicating that the majority of people can distinguish dengue infection from other diseases.

Results obtained from the present study showed that participants had better knowledge, awareness regarding symptoms of dengue fever. Based on these findings, one could propose that dissemination of knowledge about symptoms was sufficient and adequate done by our study. Many of the people knew about anti-pyretic as being useful, but the majority were unaware of the treatment of Dengue.

Most of the studies have reported that preventive measures were the best ways to bring about effective prevention of the spread of dengue fever (Singh *et al.*, 2018).

Our findings are in accordance with them. Popular methods and measures used by population were aimed to prevent water stagnation which was

local breeding sites for mosquitoes. Covering of tanks containing water, use of mosquito coils and sprays were the most popular techniques in use. Reduction in dengue hemorrhagic fever patients and dengue vectors in areas where cleaning up campaigns and programmes were organized before and during rainy seasons were found in studies done by Benthem *et al.*, Koenraadt *et al.* in Thailand (van Benthem *et al.*, 2002; Koenraadt *et al.*, 2006).

Positive correlation of knowledge regarding dengue fever in present study as shown in Table 6 was found at pretest ($r=0.10$, $p\text{-value}=0.18$), at post test ($r=0.13$, $p\text{-value}=0.10$) among participants and verifier respectively. Results obtained in the present study indicates that after implementation of knowledge regarding Dengue to the study population, they started using adequate preventive and control measures against vector's breed and its spread.

Some studies reported that most of the communities started using windows and door screens as protective measures which were also a popular method of vector control. Use of door and window curtains, covering domestic water container and treating with insecticides can reduce densities of dengue vectors to low levels and thus potentially affect the transmission of dengue (Yboa *et al.*, 2013).

Some studies have reported that population with high socioeconomic status (SES) could correlate with better knowledge scores about Dengue and hence those areas of their residency were less affected with dengue fever (Garg *et al.*, 2017).

The present study could not be generalized to populations belonging to different socioeconomic status or cultural backgrounds. Hence we recommend further studies imparting knowledge regarding dengue fever should be carried out to provide the true insight about dengue fever so that appropriate specific action and measures can be taken for control of the disease.

Limitations

The study was carried out in one given region only; a more significant population surveyed would reveal better correlation.

CONCLUSION

The present cross-sectional study conducted in a rural village population near Datta Meghe Medical College, Wanadongri, Nagpur showed a substantial increase in education of individuals regarding dengue fever and the percentage of unaware individuals had decreased substantially. Results obtained from present study indicates an increase

in the level of knowledge about Dengue and preventive practices among the study population after implementation of the knowledge (awareness) on Dengue, causation, place of breeding, time of bite and symptoms. Mean knowledge score and a percentage gain of participants and verifier were higher at posttest as compared to pretest. Henceforth we suggest health education and imparting knowledge regarding dengue control and preventive practices among the population can serve as an important tool for the control of dengue epidemic in the absence of any vaccine.

Suggestions

Given results obtained from the present study, various government and non-government organizations should conduct educational campaigns and multiple programmes to impart knowledge and create awareness regarding dengue fever to prevent dengue infection.

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Conflict of interest

Nil

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