

Original Article

Empowering Village Health Sanitation and Nutrition Committee members on dengue prevention and control: An educational interventional study in rural areas of Mysuru, Karnataka

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ABSTRACT

Objectives: Dengue, among all the vector-borne diseases, continues to be a major public health problem in India. Dengue once considered being problem in urban areas, now it is increasingly found in rural areas. Thus, empowering the village level functionaries like members of Village Health Sanitation and Nutrition Committee (VHSNC) can help in prevention and control of dengue in the rural areas. The present study was conducted to assess the effectiveness of educational intervention on perception regarding dengue and its prevention among VHSNC members.

Material and Methods: This prospective interventional study was conducted among all 305 VHSNC members of two randomly selected primary health centers of Mysuru talukas for the period of 6 months. Baseline levels of perception on dengue were collected using a pre-tested structured questionnaire. Educational intervention on various domains of dengue and its prevention was provided using audiovisual aids, handouts, and group discussion. Endline survey was conducted 1 month after the education sessions to assess the effectiveness intervention.

Results: A total of 305 VHSNC members participated in the study. In pre-test survey, only 189 (61.9%) had ever heard of disease dengue. In post-test survey, 274 (91.3%) had heard of dengue. There was a statistically significant improvement in perception regarding, preventable nature of dengue, mode of transmission, breeding and biting habits of mosquito, source reduction measures, and personal protective measures against mosquito bites following educational intervention.

Conclusion: Educational intervention was found to be effective in empowering village level stake holders like VHSNC members regarding dengue and its prevention.

Keywords: Dengue, Village Health Sanitation and Nutrition Committees, Empowerment, Vector-borne diseases, Educational intervention

INTRODUCTION

Dengue fever and its severe forms – dengue hemorrhagic fever and dengue shock syndrome – have become major international public health concern. In fact, this disease has become hyperendemic in rural, periurban, and urban areas with sporadic and frequent epidemics. At present, dengue infection is endemic in more than 100 countries of Asia-Pacific region.^[1,2] Recent global estimates suggest that more than 390 million dengue infections are reported annually.^[3]

In a study on burden of dengue infection in India, 2017: A cross-sectional population-based serosurvey report that India contributed to 34% of the 96 million apparent dengue virus infections estimated to have occurred globally in 2010. Most Indian states have been classified as having frequent or

continuous risk of dengue transmission.^[4] A meta-analysis of published studies from India estimated a dengue case-fatality ratio of 2.6% (95% confidence interval [CI] 2.0–3.4). Although dengue is a notifiable disease in India, studies and modeling estimates suggest that the disease is grossly underreported.^[5]

Carefully researched and meticulously planned advocacy, mobilization, and communication initiatives with high levels of community engagement are recognized as fundamental to the promotion of healthy behavior and social change. Dengue being a disease that is mainly influenced by human behavior, social, and environmental factors, and the health education of community with reference to modification of these factors is considered to be important step toward prevention of

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this dangerous disease. It will be possible only when the community is sufficiently empowered to take leadership in health matters.^[6]

Government of India had launched National Rural Health Mission (NRHM) which largely envisages the community to take leadership at local level, related to health and its related issues. Clearly, it requires involvement of Panchayat Raj Institutions in the management of the health system. Constitution of Village Health Sanitation and Nutrition Committee (VHSNC) is one of the special initiatives under the NRHM to improve the availability and access to quality health care for people residing in rural areas through increased ownership and power to local people.^[7] VHSNC members are expected to take measures to prevent and control the locally endemic diseases through comprehensive community efforts. Thus, these stakeholders are required to have adequate knowledge regarding various communicable diseases like dengue.

In this background, the present study was undertaken to assess the effectiveness of educational intervention on perception of VHSNC members on dengue and its prevention.

MATERIAL AND METHODS

After obtaining clearance from the Institutional Ethics Committee of JSS Medical College, Mysuru, this prospective interventional study was conducted among VHSNC members of villages under two randomly selected primary health centers of Mysuru district for a period of 6 months.

Information regarding sociodemographic characteristics were collected in a pre-tested structured pro forma by interview technique.

Assessment of perception and practices of VHSNC members about dengue with respect to causes, complications, prevention, and control were done by

- Interview method: Using a pre-tested structured pro forma for VHSNC members who could not read and write.
- Self-administered questionnaire method: Using pre-tested questionnaire for VHSNC members who could read and write.

Statistical analysis

The data collected were entered into Microsoft Excel-2010 version and analyzed using SPSS-version 18. Descriptive statistical measures such as mean, standard deviation, and percentage were applied and inferential statistical tests like Z-test for difference between two proportions were applied to test the difference between proportion of individual responses before and after educational intervention.

Wilcoxon's signed-rank test was applied to test the difference between perception scores before and after educational intervention to test the overall change in perception before and after educational intervention. The differences were interpreted statistically significant at $P < 0.05$.

RESULTS

Sociodemographic characteristics

Among 305 village health and sanitation committee members recruited in the study majority, 101 (33.1%) were in the age group of 25–34 years, 254 (83.3%) females, 118 (38.7%) had studied up to high school, 150 (49.3%) were housewives, 296 (97%) were Hindus by religion 227 (74.7%) were from nuclear families, and 112 (36.7%) were belonging to lower middle socioeconomic status according to B G Prasad classification. A total of 160 (53.7%) study participants were representatives of general population in committee, followed by 42 (13.8%) ASHA and Panchayat members, 25 (8.2%) Anganwadi workers, 24 (7.9%) school teachers, and 8 (2.6%) were junior health assistant females. A total of 164 (53.8%) were having <3 years of experience as members of VHSNC. A total of 230 (75.4%) participants had not received any formal training on their roles and responsibilities and functions of VHSNC [Table 1].

Out of 305 VHSNC members included in the study and undergone pre-test survey and received health education on dengue, 300 were available for post-test survey, thus the dropout rate was 1.63%. The reasons for dropout were, subjects went for delivery to maternal house, out of station for long time, not feeling well at the time of survey.

Pre-test survey

Among 305 participants in the pre-test survey, 189 (62.0%) had ever heard of a disease called dengue. Following educational intervention among 300 members who participated in post-test survey, 274 (91.3%) had responded that they had heard of dengue. This increase in perception was found to be statistically significant ($Z = 8.502, P = 0.001$).

Effectiveness of educational intervention on perception regarding dengue

Compared to the pre-test survey, there was improvement in perception of the study participants on various parameters related to dengue and its prevention such as preventively nature of dengue (52.4–91.6%), fatality associated with disease (39.7–78.5%), mosquito borne transmission of dengue (63.5–94.9%), breeding habit of mosquito (30.0–73.1%), biting habit of mosquito (11.0–62.7%), seasonal variation in dengue (22.8–42.0%), replacement of water from storage tanks at least once in a week (46.6–82.1%), and source reduction measures like preventing artificial collection of water (54.0%–82.1%)

following educational interventions. These differences in perception were found to be statistically significant [Table 2].

Among 305 VHSNC members included in the pre-test survey, when enquired about methods to avoid mosquito bites, majority 165 (54.1%) subjects were aware of bed nets followed by 98 (32.1%) mosquito repellent coils. Following educational intervention among 300 VHSNC members in post-test survey, when enquired about the same, majority 254 (84.7%) subjects were aware of bed nets followed by 201 (67.0%) mosquito repellent coils. These differences were found to be statistically significant [Table 3].

Pre-test survey revealed the overall median perception score on dengue and its prevention to be 17 (interquartile range [IQR] 12–21). Following educational intervention, overall perception score during post-test was found to be 24 (IQR

19–29). This improvement in overall perception scores was found to be statistically significant [Table 4].

DISCUSSION

Dengue is a disease of major public health concern in India. Once considered to be an urban phenomenon, the disease is now a common entity in rural areas as well. Dengue outbreaks are difficult incidents to manage in rural areas due to lack of availability, accessibility, affordability, and utilization of health-care services among rural populace. Thus, prevention of dengue and its outbreaks are a sole strategy that is expected to be effective in these areas. Empowerment of local level stakeholders is a key to achieve this strategy.^[6] VHSNCs are the decision-making bodies at the village level in relation to health, sanitation, and well-being. Thus, empowering them with knowledge of prevention and control of dengue could have long-term impact in reducing the burden of this disease in rural communities.^[8]

There was a significant improvement in perception of VHSNC members on dengue and its prevention after structured educational intervention. The similar results were observed by Nagar *et al.* in Bhopal, India, where there was

Table 1: Distribution of the study subjects based on their sociodemographic characteristics.

Category	Number (%)
Age (years)	
15–24	79 (26)
25–34	101 (33.1)
35–44	74 (24.2)
45–54	22 (7.2)
55 and above	29 (9.5)
Sex	
Male	51 (16.7)
Female	254 (83.3)
Educational status	
Illiterate	60 (19.7)
Primary	16 (5.2)
Middle	50 (16.4)
High school	118 (38.7)
Degree/diploma	43 (14.1)
Graduate	14 (4.6)
Postgraduate	4 (1.3)
Occupation	
Professional	7 (2.3)
Service	91 (29.8)
Business	5 (1.6)
Agriculture	25 (8.2)
Laborer	27 (8.8)
Housewife	150 (49.3)
Religion	
Hindu	296 (97)
Muslim	7 (2.3)
Christian	2 (0.7)
Type of family	
Nuclear	227 (74.4)
Non-nuclear	78 (25.6)
Socioeconomic status (B G Prasad classification)	
Upper	99 (32.5)
Upper middle	42 (13.8)
Lower middle	112 (36.7)
Upper lower	36 (11.8)
Lower	16 (5.2)

Table 2: Comparison of perception regarding dengue and its prevention before and after educational intervention.

Perception item	Pre-test n=189	Post-test n=274	P*
Dengue is a preventable disease	99 (52.4)	251 (91.6)	0.001
Dengue can be fatal if untreated	75 (39.7)	215 (78.5)	0.001
Mosquito borne transmission of dengue	120 (63.5)	260 (94.9)	0.001
Replacement of water from storage tanks at least once in a week	88 (46.6)	225 (82.1)	0.001
Source reduction measures like preventing artificial collection of water	102 (54.0)	210 (80.8)	0.001
	Pre-test n=120	Post-test n=260	
Breeding habit of mosquito as fresh artificial collection of water	36 (30.0)	190 (73.1)	0.001
Day biting habit of mosquito transmitting dengue	13 (11.0)	163 (62.7)	0.001
Monsoon and post-monsoon as dengue transmission season	43 (22.8)	134 (42.0)	0.001

Figures in parenthesis indicate percentages, *Z-test for difference between two proportions

Table 3: Comparison of perception regarding personal protection measures against mosquito bites methods to avoid insect bites before and after educational intervention.

Methods	Pre-test	Post-test	Z	P
Mosquito repellent coils	98 (32.1)	201 (67.0)	8.58	0.001
Mosquito repellent creams and oil	60 (19.7)	134 (44.7)	6.58	0.001
Bed nets	165 (54.1)	254 (84.7)	8.15	0.001
Wire mesh to windows	53 (17.7)	145 (48.3)	8.01	0.001
Wearing full sleeve clothes	60 (19.7)	121 (40.3)	5.53	0.001
Do not know	85 (27.9)	31 (10.3)	5.49	0.001

Table 4: Comparison of overall perception scores before and after educational intervention.

Category	Median	IQR	Z	P
Pre-test	17	12–21	15.18	0.001
Post-test	24	19–29		

*Wilcoxon signed-rank test

increment in the knowledge regarding dengue to the extent of 18.8% among people in rural community after educational intervention.^[9] In a large-scale community-based study, intervention on dengue conducted at Tampouy, Africa, by Ouédraogo *et al.* observed that following structured interventions through health education and vector control measures, there was a significant improvement on knowledge about dengue (risk ratio [RR] 1.13 [95% CI 1.01–1.27]) and disease symptoms (RR 1.44 [95% CI 1.22–1.69]) and was less likely to associate dengue with malaria (RR 0.70 [95% CI 0.58–0.84]). Respondents self-reported that they had increased their actions against mosquitoes (RR 1.42 [95% CI 1.29–1.57]) and used more bed nets (RR 1.31 [95% CI 1.22–1.42]). The study concludes that well-planned, evidence/community-based interventions that control exposure to dengue vectors are feasible and effective in settings that have limited resources.^[10]

Thus, it is imperative to note that VHSNCs are the major resources in rural communities, who can act as agents of change once empowered with adequate knowledge related to dengue. Long-term goal of National Vector Borne Disease Control Programme clearly emphasizes the role of VHSNC members in strengthening the surveillance system of dengue and chikungunya in rural communities.^[11] To perform this task efficiently, they need to be empowered with adequate knowledge and skills pertaining to the disease and its prevention. Specifically tailored educational interventions considering the social background and literacy status of these members are expected to give desired outcomes.

CONCLUSION

Structured educational interventions through audiovisual aids and group discussions were found to be effective strategies to empower the VHSNC members on dengue and its preventions. There is a need to replicate similar interventions in different parts of the country to achieve better community participation in dengue prevention and control.

Declaration of patient consent

Institutional Review Board (IRB) permission obtained for the study.

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Conflicts of interest

There are no conflicts of interest.

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