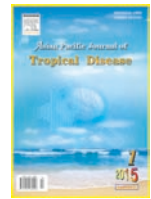




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Awareness regarding dengue fever among the link workers of urban health centres of Bengaluru City-South India

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ABSTRACT

Objective: To assess awareness of link workers regarding dengue fever and its prevention and the effect of health education about dengue and its prevention.

Methods: Prospective interventional study was conducted in selected urban health centers of Bengaluru. About 106 link workers selected by systematic random sampling were interviewed by trained investigators. Health education was given to all of them and awareness was reassessed after a gap of one month.

Results: Mean age of link workers was (36.95 ± 5.88) years. A total of 49.06% of link workers were aware that dengue is caused by virus, 74.53% were aware of complications of dengue, 87.74 % were aware that dengue is spread by *Aedes mosquito*. After health education the above observations increased to 81.4%, 87.63%, and 90.72% respectively. Difference between mean pre- and post-test score was statistically significant ($P < 0.05$).

Conclusions: Awareness regarding dengue fever and its prevention was poor among link workers, which improved significantly after health education.

1. Introduction

Dengue is the most rapidly spreading mosquito-borne viral disease in the world. In the last 50 years, its incidence has increased 30-fold with increasing geographic expansion to new countries. According to WHO, an estimated 50 million dengue infections occur annually in the world and approximately 2.5 billion people live in dengue endemic countries[1]. Most of these are in tropical areas of the world. The greatest risk occur in sub-tropical and tropical countries like Indian sub-continent[2,3].

It is caused by any one of four closely related serotypes of dengue virus 1, 2, 3, 4 transmitted by *Aedes aegyptimosquito*[4-6]. *Aedes aegypti* is the main vector species of dengue fever (DF) or dengue haemorrhagic fever in India and is common in most of the urban areas on account of deficient water management, presence of non-degradable tyres and long-lasting plastic containers as well as increasing urban agglomerations and inability of the public health

community to mobilize the population to respond to the need to eliminate mosquito breeding sites[3,7]. Considering the severity of disease, non-availability of specific drug for treatment and increased mortality and morbidity, preventive measures implemented by integrated vector control approach assumes high priority. Success of this approach is largely influenced by community acceptance and participation[8].

Link workers are health care workers in urban areas who were introduced under phase II of Reproductive and Child Health. They are connecting people between health system and community. Apart from Maternal and Child Health activities, these link workers are also involved in identification of cases with fever, surveillance of mosquito breeding sites during house-to-house visited in allotted wards and anti-larval activities. They are the key persons to induce the behavioral change in people.

There are few studies available in India with respect to the awareness of DF and its prevention measures among health care workers. In this regard, above study was undertaken to assess awareness of link workers regarding DF and its prevention and the effect of education intervention among them in Bengaluru city for the first time.

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2. Materials and methods

It was a prospective interventional study conducted for a period of 4 months (January 2013–April 2013) in Bengaluru City. List of link workers working in urban health centers of Bengaluru city were obtained from Health Department, Bruhat Bengaluru Mahanagara Palike, Bengaluru. There were 318 link workers working at the time of study from all Urban Health centers. List of link workers were arranged in an order and every 3rd link worker was selected using systematic random sampling method leading to sample size of 106 link workers.

All the selected link workers were interviewed in their health centre using semi-structured, pre-tested questionnaire by trained investigators. Details regarding DF signs and symptoms, complications, other diseases caused by *Aedes mosquito* (*Ae. mosquito*), measures to control the vector, identification of breeding places, larvae survey and other information were collected. Health education on DF was given in 3 batches by lectured using demonstration charts in local language supported by audio visual aids and discussion. During health education all the link workers were shown mosquito larvae individually and were told about larvae survey by an entomologist. After a gap of one month of health education session, their awareness was reassessed using the same questionnaire by the trained investigators to know the impact of health education.

The data was entered and analyzed in SPSS version 19.0. Descriptive statistics like frequency, proportions, inferential statistics like *Chi*-square test and Wilcoxon signed rank test were used. All the values of $P < 0.05$ were considered statistically significant.

3. Results

Out of 106 link workers, 68 (64.15%) were in the age group of 31-40 years, with mean age of (36.95 ± 5.88) years (mean ± SD). About 80 (75.47%) had studied up to higher secondary education and 38 (35.85%) of the link workers had 5-10 years of experience (Table 1). Health education was given to all of them. A total of 97 (91.5%) link workers were available for resurvey after a gap of one month following health education.

Table 1

Sociodemographic profile of study subjects ($n = 106$).

Parameters		Number	Percentage
Age (years)	21-30	13	12.26
	31-40	68	64.15
	41-50	24	22.64
	> 50	1	0.94
Education	Higher secondary	80	75.47
	PUC/diploma	23	21.70
	Degree	3	2.83
Duration of work experience (years)	< 1	3	2.83
	1-3	24	22.64
	3-5	10	9.43
	5-10	38	35.85
	> 10	31	29.25

PUC: Pre-University Certificate.

It was showed that 49.06% were aware of DF being caused by virus, 74.53% were aware of complications of DF, 43.40% aware of different types of mosquito and only 14.15% aware of diseases caused by *Ae. mosquito*. After health education, their awareness increased to 81.4%, 87.63%, 78.35%, 95.88% respectively and the difference was statistically significant ($P < 0.05$). Most of the link workers were aware of DF being spread by *Ae. mosquito*. Awareness about flight range of *Ae. mosquito* was 14.15%, biting habit of *Ae. mosquito* was 90.57% which increased to 60.82% and 94.85% respectively after health education. It was observed that awareness regarding larvae survey was found to be low (17.92%). Awareness regarding larvicidal fishes, frequency of cleaning water containers, insecticide treated nets was 6.60%, 46.23%, 3.8% which increased to 98.96%, 82.47%, 83.50% respectively after health education and difference was statistically significant ($P < 0.05$). It was revealed that 66 (62.26%) of the link workers have undergone training regarding DF and its prevention in the last one year. Most of the link workers *i.e.* 103 (97.17%) were aware that *Aedes* breeds in artificial collection of water. (Table 2).

Table 2

Awareness of link workers regarding DF.

Awareness regarding DF and its prevention	Before n (%)	After n (%)	χ^2 value*	P value
DF is caused by virus	52 (49.06)	79 (81.4)	23.21 ^a	< 0.05
Knowledge regarding complications of DF	79 (74.53)	85 (87.63)	5.60	0.008
Different types of mosquito	46 (43.40)	76 (78.35)	25.81 ^a	< 0.05
Diseases caused by mosquitoes	15 (14.15)	93 (95.88)	135.9 ^a	< 0.05
Awareness regarding spread of DF by <i>Ae. mosquito</i>	93 (87.74)	88 (90.72)	0.46	0.24
Flight range of <i>Ae. mosquito</i> (100 meters)	15 (14.15)	59 (60.82)	47.63 ^a	< 0.05
Awareness about <i>Ae. mosquito</i> bites during day time	96 (90.57)	92 (94.85)	1.35	0.12
Seen mosquito larvae	19 (17.92)	97 (100.00)	19.18 ^a	< 0.05
Awareness about fishes eating larvae	7 (6.60)	96 (98.96)	172.9 ^a	< 0.05
Frequency of cleaning water containers (weekly once)	49 (46.23)	80 (82.47)	28.73 ^a	< 0.05
Awareness regarding insecticide treated nets	4 (3.8)	81 (83.50)	132.3 ^a	< 0.05

Statistical significance was observed in pre- and post-health education session with regard to causation and complication of dengue fever, different vector borne disease and their agent, flight range and larva of *Ae. mosquito*, control and preventive measures like larvivorous fishes, cleaning water containers, use of insecticide treated nets. McNemear test is used.

It was observed that mean pre-test score was 9.46 whereas mean post-test score was 13.51 and the difference was statistically significant (Wilcoxon signed rank test; $Z = 8.093$, $P < 0.001$) (Table 3). There was significant increase in awareness level among link workers regarding DF and its prevention after health education.

Table 3

Comparison of pre-test and post test scores.

Pre-/Post-test	Mean	SD	Z score	P value*
Pre-test	9.46	2.24	8.093 ^b	< 0.001
Post-test	13.51	1.81		

*: Wilcoxon signed rank test. Statistical significance was observed in pre- and post-test scores using Wilcoxon signed rank test.

4. Discussion

This study is an attempt to identify the awareness of DF and its prevention among link workers who are the first line of contact

in health care delivery for the people in Bengaluru city and play a pivotal role in bringing about behavioural change among people with regard to DF and other mosquito borne diseases.

It was observed in our study that 87.74% were aware of DF spread by *Ae. mosquito*. A similar study involving link workers of urban health centres in Ahmedabad city conducted by Prajapati Arpit *et al.* showed that 87.9% were aware of DF spread by *Ae. mosquito*[9]. A study conducted by Palanivel Chinnakal *et al.* in Delhi, North India involving adult population showed that 86% were aware that dengue is spread by mosquito[10]. It was observed that 68.4% of adult respondents were aware of dengue spread by mosquito bite in a study conducted by Samir Singru *et al.* in Pune[11]. It appears that there is fairly good knowledge about the spread of DF among link workers and public because of common occurrence of cases in the community.

In this study, 90.57% were aware of biting pattern of *Ae. mosquito* however 59.1% of link workers in study done by Prajapati Arpit *et al.*[9], and 23.8% of adult population in study done by Palanivel Chinnakal *et al.*[10] were aware about biting pattern. Other studies differ from our results showing poor awareness regarding biting pattern.

Regarding knowledge of breeding places of *Ae. mosquito*, 95.88% of link workers were aware in this study. Whereas in a study conducted by Prajapati Arpit *et al.*[9] in Ahmedabad showed 49.3% were aware. In a community based studies by Palanivel Chinnakal *et al.* showed 23.8%[10] and by Samir Singru *et al.* showed 36.4% were aware of breeding sites of the mosquito[11]. There was good awareness of breeding places of mosquito in this study but other studies showed poor awareness.

In this study only 7% of link workers were aware of larvicidal fishes. Whereas in a study conducted by Prajapati Arpit *et al.*[9] 54.7% were aware about larvicidal fishes. Awareness regarding larvicidal fishes used in mosquito control is poor in our study.

A study conducted by Poonam Ramesh Naik *et al.* in south India showed that 60.61% were aware that dengue is caused by mosquito bite, 34.9% of the respondents were not aware of symptoms of DF. Only 51.36% were aware of preventive measures for DF. Author concludes that there is need for increasing the awareness on DF and its prevention in the community by involving health workers and taking other measures[12].

The awareness regarding DF and its prevention among link workers working in the urban health centres was found to be poor. There was an overall improvement after health education. We recommend that to sustain the awareness regarding DF and other vector borne diseases, there is a need for periodic health education of link workers regarding the same at least once in a year. This in turn will help to improve awareness among people in community.

Conflict of interest statement

We declare that we have no conflict of interest.

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