School Training Strategies for Prevention and Control of Dengue

Sir,

Aedes is one of the medically important arthropods serving as a vector for dengue virus along with other viruses such as yellow fever, chikungunya, and zika. The global burden of dengue is evident with 3.9 billion people at risk, 20,000 deaths, and 500,000 hospitalizations annually.[1] The limited efficacy and resource intensiveness of the employed interventions for dengue vector control renders to explore alternatives for combating the outbreak of dengue fever. Sustainable community participation and school-based health education interventions have eventually evolved as an effective tool in larval source reduction over other interventions.[2] Children have inherent inquisitiveness and eagerness to learn new things. Thus, they can serve as an effective change agent in bringing about behavioral change among any community. The present study was designed to give a comprehensive amount of groundwork research which led to the development of an effective training material.

Training strategy implies to the integration of resources and skills needed to accomplish a particular goal. The study aimed to increase knowledge on dengue, its signs and symptoms, mosquito breeding sites, and mosquito life cycle followed by inculcation of good practices for the prevention of dengue. Various training modalities were used for achieving the set-forth objective, which involved implementation of more than one training method.

“Training strategy and Modality-Six Orientations”[3] was used as a basis for designing the training materials. It was a two-dimensional paradigm with “content” and “process” in the vertical axis explaining the input required for training. The horizontal axis had “concept” and “practice,” which explained the final learning goals that need to be disseminated among the trainees. To evaluate the effectiveness of the designed training materials, a cross-sectional pilot study was carried out in 3 months (January–March 2017) after necessary ethical measures. Four Zilla Parishad schools of Shameerpet Mandal in Hyderabad were selected by random sampling and 122 students of class V–VII who were present at the time of data collection were involved in the study. A questionnaire, designed in local language (Telugu) and consisting of 17 questions relating to identification of dengue vector, its life cycle, breeding sites, vector control measures, dengue management, and environmental sanitation measures, was administered among the participants before the commencement of the training program to access their baseline knowledge about dengue fever. Then, training was conducted using the customized and tailored training materials by the team. After the educational session, the knowledge was reassessed using the same questionnaire.

The present study involved four orientation designs. The “academic orientation” emphasized on transmitting the knowledge/information through PowerPoint presentations (PPTs) on dengue and life cycle of Aedes mosquito. Further, an animated video on dengue fever with “Chotta Bheem” cartoon characters (popular TV program among children) and “life cycle video” dubbed in Telugu and Hindi were used to engrave the knowledge gained through the PPTs.

The “laboratory orientation” opened an opportunity to gain concept through process and from direct experience. The study materials were designed in a way that the participants could learn through some activities. Pencil sketch scenery on dengue mosquito breeding sites were provided to the children to color and circle the breeding points to find places of presence of Aedes egg, larva, or pupa. In addition, a “game on life cycle” was designed to ensure the reach of correct knowledge to the target group. The game consisted of pictorial illustration of egg, larva, pupa, and adult to be pasted in correct order using their acquired knowledge. Furthermore, an immensely customized version of the Indian traditional game called “Snakes and Ladders” on “preventive practices against dengue” was used to inculcate good practices in their daily routine. The theme of the design board was “Dos” (good practices) and “DON’Ts” (bad practices) [Figure 1a].

The “activity and development orientation” is commonly oriented toward practicing an acquired behavior either through content or process. Here, the students were taken to a field trip for 15 min and the breeding sites were shown to them (content). Further, demonstrations on various preventive measures such as covering of water containers, removing stagnant water from air coolers and refrigerator, keeping containers (for example: grinding stones) upside down when unused, method of disposal of coconut shells and plastic containers, etc., (process) were given to the participants. Customized labels with Dos and Don’ts for notebooks [Figure 1b] along with posters and pamphlets on dengue were distributed to all the participants for reinforcement of the knowledge transferred through the training modalities. Thus, students were able to learn through information, observation, and by doing.

Although several studies have used different training materials for school children such as flip charts and visual aids, this paper is a modest contribution to the ongoing development of training materials used for health education.[4,5] It investigated the training strategies and modalities in designing training materials for school-based dengue intervention using all the four basic principles of learning, i.e., participation, repetition, feedback, and reinforcement. Result of McNemar’s Q-test revealed significant improvement of knowledge in all domains covered during the training program [Table 1]. Most incorrect responses were observed...
for vectors (80.33%) and breeding sites of vector (80.33%), followed by time of bite of mosquitoes (78.68%), life cycle of the vector (67.21%), symptoms and preventive practices (57.38%). In the posttest condition, the highest conversion from incorrect responses to correct response was observed for vector name (48.36% change), symptoms of dengue (38.53% change), cause of infection and transmission (35.24% change), and life cycle (34.42% change). The significant improvement in knowledge toward dengue could be attributed to the customized and tailored training materials designed by employing the training strategies and modalities. Thus, this research showed that school-based dengue intervention aided by customized and tailored training materials with a participatory approach can be a very effective medium for bringing about sustainable behavioral change among community.

Acknowledgment
The authors acknowledge the guidance by Dr. S. Ameer Basha and Professor Jeyashankar, Telangana State Agricultural University, Hyderabad as well as cooperation extended by the surveyed schools.

Financial support and sponsorship
Financial support received from Indian Council of Medical Research (ICMR) and Indian Council of Social Science Research (ICSSR) (File No. 25/2016/ICMR-ICSSR-SBR).

Table 1: Overview of the learning principles and training modalities used for designing the training materials for school intervention

| Objectives | Principles | Training orientation | Resources | Expected outcome |
|------------|------------|----------------------|-----------|------------------|
| Increase knowledge on dengue, vectors, signs and symptoms | Learning from information | Academic orientation (use of content to understand concept) | PPTs, videos | Overall increase in dengue knowledge |
| Provide in depth information about breeding sources and developmental sites of Aedes mosquito | Learning from observation | Laboratory orientation (use of process to understand concept) | Games such as Snakes and Ladders, life cycle, coloring sheet | Participants would be able to identify breeding sites in and around human habitation |
| Inculcate good practices and prevent bad practices | Learning from doing | Activity and development orientation (use of content as well as process to put into practice) | Field trip, demonstration | Knowledge gained could be successfully translated into practice |

PPTs: PowerPoint presentations

Figure 1: (a) Specimen of few training materials used for school intervention for dengue customized version of “Snakes and Ladders” (b) Labels for notebooks

Conflicts of interest
There are no conflicts of interest.

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How to cite this article: Alok S, Nessa S, Ahil SB. School training strategies for prevention and control of dengue. Indian J Community Med 2020;45:106-7.

Received: 22-03-19, Accepted: 27-09-19
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