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Original Article

Cardiovascular health awareness and the effect of an educational intervention on school-aged children in a rural district of India

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ARTICLE INFO

Article history:
Received 28 July 2015
Accepted 7 October 2015
Available online 11 January 2016

Keywords:
Cardiovascular disease prevention
School health program
Health awareness
Risk factors
Survey

ABSTRACT

Background and objectives: India is the second most populous country in the world and two-thirds of its population is less than 35 years old. This survey was conducted to assess the level of health awareness of cardiovascular disease in adolescent school-aged children 14–16 years old, with the goal of establishing school-based health education and development of heart-healthy lifestyle practices.

Methods: A school-based survey was conducted in the rural district of West Midnapore, India between June and July of 2014. This involved a pre-evaluation of cardiovascular disease (CVD) health awareness, a short presentation on CVD, and a post-evaluation of CVD health awareness.

Results: A total of 2995 students (48% response rate) from 20 schools participated in the survey. The mean age of the students in the study sample was 14.7 years, 46% were male, 53% were in the 9th grade, and the rest were in the 10th grade. After assessing students' awareness in six domains with 20 multiple-choice questions with a maximum score of 100, the mean pre-test score was 41.1 (SD ± 10.5) and the mean post-test score was 48.1 (SD ± 16.9) ($p < 0.001$).

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Abbreviations: CVD, cardiovascular disease; WHO, World Health Organization.
http://dx.doi.org/10.1016/j.ihj.2015.10.302

Conclusions: Awareness of CVD and its risk factors was far from optimal among the adolescent school-aged children in this study. A school-based educational program may help improve awareness of CVD and reduce the future disease burden in the community. The results of this study may be useful in formulating a nationwide school health program to deal with the emerging epidemic of CVD in countries such as India.

1. Introduction

Cardiovascular disease (CVD) is the leading cause of death in industrialized nations.[1,2] In the developing world, infectious diseases have long been considered to be the most common cause of death. However, with increasing economic development and adoption of Western lifestyles, CVD is becoming an important health concern in many developing countries.

Several studies[3–5] have demonstrated that health knowledge and awareness are key factors in preventing many chronic diseases, including CVD. Since atherosclerosis begins in the second decade of life, and many of the contributory factors are better controlled if addressed early, health awareness of CVD and its precursors among school-aged children is of considerable importance for the primary prevention of CVD.[6–9]

India is the second most populous country in the world and two-thirds of its population is under age 35.[10] With all the features of a rapidly developing country, accompanied by changes in dietary habits and increasingly sedentary lifestyles, many people in India will be affected by CVD in the future. Currently, there is no established school health program in India to promote health education and awareness about CVD and its risk factors. To understand the potential opportunity for a school-based education program about the early detection of risk factors for CVD and the development of heart healthy lifestyle practices, we performed a questionnaire survey to assess the level of health awareness and knowledge of CVD and its risk factors among adolescent school-aged children.

2. Methods

A school-based survey was conducted in Garbeta II block in the district of West Midnapore, West Bengal, India from the middle of June until the middle of July 2014. This is a large rural district with a population of 5,943,300, and population density of 636 per square kilometer (1650 per square mile). By population, its size ranks 14th out of 640 districts in India. The overall literacy rate in the district is 70% (male 81%, female 59%) and the majority of residents work in agriculture. There were 20 high schools in Garbeta II block that taught adolescent children in the 9th and 10th grades; approximately 200 students in each school were eligible for our questionnaire survey.

2.1. *Recruitment of students*

Headmasters from the 20 schools were contacted by the study team and all agreed to participate in the study. One month prior to the survey, an announcement was made in each of the classes involved about the survey to be conducted. Information was provided on the school notice boards and pamphlets about the study were made available through the school's common room and classes. Participation in the survey was entirely voluntary. Attending the session for the survey was taken as assent for study participation. This was explained at the time of the initial announcement and also in the pamphlets. There was an option to leave the class if any student chose not to participate in the survey. Students in 9th and 10th grades who were present in school on the day of the study (a total of 2995 students with a 48% response rate from 20 schools) participated in the survey. Among the students present in the school, not a single student opted out from the survey.

2.2. *Ethical issues*

The study was a joint venture of Tufts University, Boston, USA and Kolkata Medical College, India and it had approval from the IRB of Tufts University and the local ethics committee.

2.3. *Survey administration*

The survey followed a three-step process: a pre-test, a short lecture covering the essential elements under study, and a post-test using the same questions as in the pre-test. A total of 90 minutes was allocated to conduct the survey. This included time spent on seating arrangements, announcements about the study and the survey's objectives and methods, the answering of any queries from the students, and collection of the answer sheets. Instructions about completing the answer sheet for the questionnaire were read aloud and explained so that every student understood the total number of questions asked, the stems under each question, and the total time allotted. It was also emphasized that the questionnaire for the survey was not a test of their school performance and would not affect their school grades.

Prior to conducting the survey, a questionnaire containing 20 questions was developed and validated in the index study population. Six domains were assessed including: (1) the concept and definition of coronary artery disease; (2) its prevalence and impact on individuals and society; (3) modifiable and non-modifiable risk factors for CVD including age, sex, family history, diabetes, hypertension, high cholesterol, and smoking; (4) the role of a heart healthy life style; (5) the importance of a multidisciplinary approach to CVD prevention; and (6) the benefits of the multidisciplinary lifestyle approach beyond CVD.

The initial survey questionnaire (pre-test) was administered over a period of 20 minutes. This was followed by a 20-minute standardized presentation by a physician from the study team