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ARE CHINESE STUDENTS WILLING TO LEARN AND PERFORM BYSTANDER CARDIOPULMONARY RESUSCITATION?

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Abstract—Background: Immediate cardiopulmonary resuscitation (CPR) can improve survival rate from cardiac arrest and students are potentially important bystander CPR providers. **Objective:** Our aim was to investigate the willingness among Chinese students to learn and perform bystander CPR. **Methods:** Questionnaires were distributed to 1407 students. The survey investigated the willingness to learn and perform bystander CPR and the barriers to performing CPR on family members and strangers, assuming that students had mastered CPR. **Results:** Only 14.6% of respondents reported having ever attended CPR training classes, however, 88.3% expressed their willingness to learn. The main characteristics of the students who were willing to learn were the following: they considered the development of the local emergency system excellent (odds ratio [OR] = 3.15); cardiovascular diseases were present within their family (OR = 2.74); and they had previously heard about CPR (OR = 2.43). Almost all respondents (94.6%) reported that they would conduct bystander CPR on family members, while only 59.7% of respondents would do it for strangers. A lack of confidence was the principal barrier to doing CPR for family members (78.4%) and the leading barrier to stranger CPR was the fear of legal liability if their lifesaving attempts failed (90.8%). The complicated process of performing CPR was also a major barrier in both scenarios. **Conclusions:** When there is a great desire to learn CPR, the rate and effect of training can be significantly improved by providing students with regular CPR training, especially compression-only CPR training. Training classes should focus on enhancing the participants' confidence. In addition, legislation by the government is needed to protect the rescuers. © 2016 Elsevier Inc. All rights reserved.

Keywords—bystander CPR; schools; willingness; training; cardiopulmonary resuscitation

INTRODUCTION

The survival rate from out-of-hospital cardiac arrest depends on each link in the survival chain, and it can be improved considerably by immediate bystander cardiopulmonary resuscitation (CPR) (1–4). The attitude toward, and training in, CPR are both important factors that can increase bystander contribution to survival (5). However, the bystander CPR and CPR-training rates remain insufficient, even in Western countries (6–8). So, we speculated that both rates are also deficient in China. With the largest population in the world, China also has the highest incidence of sudden cardiac arrest in the world (9). These two factors lead to low survival rates and poor outcomes in China.

CPR training has been brought into schools in many countries, enhancing the training rate significantly (10–12). Knowing CPR and its procedures not only decreases the anxiety of students, but also increases the likelihood they will perform CPR (13,14). In 2010, the American Heart Association published upgraded guidelines for CPR, which changed the process from A-B-C (airway–breathing–compressions) to C-A-B (compressions–airway–breathing), and also provided a

relatively simple process for laypeople—compression-only CPR—which clearly emphasizes the significance of compressions in CPR (3,4). In recent studies, CPR training, willingness to perform CPR, and relevant factors vary among counties and students (6,10,15–18).

Generally, the main reasons for not performing CPR are poor knowledge, having forgotten how, panic, and anxiety during an emergency situation (11,16,19). The aim of this study was to investigate the training rate and willingness to learn CPR among Chinese students with different educational backgrounds. Specifically, we measured the willingness to perform CPR, assuming that the students had mastered CPR procedures, and we sought to define the relevant reasons that influenced their willingness. Additionally, we surveyed students on their experience in CPR training and rescuing others using CPR.

MATERIALS AND METHODS

Study Design

The survey was administered by a research team that included 1 professor and 21 medical students dressed in uniforms from June 2013 to September 2013 in Wuhan, China. We used a self-designed questionnaire consisting of multiple-choice questions and let subjects fill out the questionnaire by themselves. The survey items were presented in five sections: respondent demographic characteristics; experience in CPR training and rescuing others using CPR; willingness to learn CPR; knowledge of CPR; and willingness and corresponding reasons whether or not to perform CPR on a family member or a stranger, assuming that the students had mastered CPR procedures. Eight nursing teachers from the nursing faculty and 146 nonmedical students were selected randomly on the street to review the questionnaire before the formal survey to improve its quality, clarity, and brevity. To minimize bias among research assistants, all assistants were trained in survey methodology and complete CPR procedure conducted by the professor. They were required to study CPR and practice the operational skills of CPR until they passed the examination on the CPR manikin.

Study Setting and Population

The study subjects were selected randomly from schools and public places in Wuhan, such as parks, beaches, and squares. The proportion of subjects was stratified by the geographic distribution of schools in Wuhan, ranging from middle school to university. Informed consent was obtained from each subject, who voluntarily participated in the survey. In order to improve the response rate of subjects and the effective rate of questionnaire

completion, a research assistant would explain the purpose of our survey to prospective participants and would also check the questionnaire for completeness after the participants had filled it out. To be eligible to participate in the study, subjects had to be students attending any school between middle school and university levels and between the ages of 10 and 32 years. Any person who did not meet these criteria was deemed to be ineligible for the study and was not included in the data analysis.

Data Analysis

Each completed questionnaire was assigned a unique, anonymous reference number and was entered into EpiData (version 3.1, EpiData Association, Odense, Denmark) to create a database. Then, 10% of the data were extracted randomly from the database and verified with the original questionnaire to guarantee consistency. Subjects with missing data were eliminated from the analysis if the missing data were necessary to determine their knowledge of, or willingness to perform, CPR.

Percentages of respondents were calculated for demographic characteristics, experience in CPR training and rescuing others, and willingness and corresponding reasons for performing CPR. Age and knowledge score of CPR are presented as median (Q1–Q3). We conducted multivariate logistic regression analysis to seek associations between the willingness to learn CPR and the characteristics of the respondents. The objective factors associated with the respondents' willingness were analyzed using two independent samples in a nonparametric test, χ^2 test, or Fisher's exact test, where appropriate. SPSS (version 13.0, SPSS Inc., Chicago, IL) was used for all statistical analyses. All reported *p* values were two-tailed, and *p* < 0.05 was considered statistically significant.

RESULTS

Respondents

A total of 1832 subjects initially participated in this survey, 397 of whom did not meet the inclusion criteria, and 30 subjects did not finish the questionnaire, leaving 1407 subjects, for a response rate of 76.80%. Cronbach's α is a measure of internal consistency. The coefficient of 0.76 was good, considering that 0.70 is the cutoff value for being acceptable. The main characteristics of the participants are shown in Table 1. Median age of respondents was 18 years and 47.9% were male, the details of distribution of age were shown in Figure 1. Other characteristics of the participant group included the following: 80.8% lived in urban areas, 43% had less than a bachelor's degree, 31.9% had family members with

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