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## An exploration of attitudes toward bystander cardiopulmonary resuscitation in university students in Tianjin, China: A survey



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## ABSTRACT

**Background:** Despite the importance of early effective bystander cardiopulmonary resuscitation (CPR) to improve survival rates from out-of-hospital cardiac arrest, the attitudes toward performing, learning and disseminating CPR in university students of China are still unclear.

**Methods and Aims:** To assess the attitudes regarding performing, learning and disseminating bystander CPR in university students of China.

**Results:** The results indicated that except for the scenario where the victim was their own family member or close friend, all other scenarios showed a relatively dimly lower rate of positive response. Besides, it showed a greater willingness to perform chest compression only CPR (CC) than chest compression with mouth-to-mouth ventilation (CCMV) ( $P < 0.05$ ). Females were more willing to perform CC across seven of the hypothetical scenarios than males. University students of medical-related specialties (45.3%) than university students of non-medical specialties (29.9%) were more willing to perform bystander CPR ( $P < 0.05$ ). The top four reasons for being unwilling to perform bystander CPR were lack of confidence (32.9%), fear of legal disputes (17.2%), fear of disease transmission (16.0%) and feeling embarrassed (14.0%). 92.6% of respondents wanted to learn CPR and 80.3% of respondents were willing to disseminate CPR.

**Conclusions:** CPR technique, victim's status, respondent's specialty and respondent's gender affected the attitudes of respondents toward performing bystander CPR. The top four reasons for being unwilling to perform bystander CPR were lack of confidence, fear of legal disputes, fear of disease transmission and feeling embarrassed. However, the key reason for being unwilling to perform bystander CPR differed in different specialties and particularly 'feeling embarrassed' might be a cultural phenomenon. The attitudes toward learning and disseminating CPR were positive and affected by respondent's gender and specialty.

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### 1. Introduction

Early effective bystander cardiopulmonary resuscitation (CPR) significantly improves survival rates from out-of-hospital cardiac arrest (OHCA) and promotes a long-term recovery (Holmberg et al., 2000; Iwami et al., 2012; Stiell et al., 2003). However, the reported rate of bystander initiated CPR at cardiac arrest and survival rates from OHCA are respectively lower than 40% and 10% (Ahn et al., 2010; Bobrow et al., 2010; Huo and Xu, 2001; Nichol et al., 2008; Nishiuchi et al., 2008; Zhang et al., 2010).

OHCA is a crucially time-dependent event, and one of the key factors to improve the outcome in OHCA is to promote the willingness of people to attempt bystander CPR. The 2010 CPR guidelines

(Hazinski et al., 2010) changed the order of CPR from ABC (airway–breathing–compression) to CAB (compression–airway–breathing) and now recommend compression-only CPR (CC) for untrained lay rescuers and dispatcher-assisted CPR to increase CC by bystanders, and the increasing evidence in favor of layperson CC simultaneously encourages bystanders to use CC because the approach is easier to teach, learn, remember and perform than conventional CPR (Hallstrom et al., 2000; Kern et al., 1998; Sayre et al., 2008).

It is noteworthy that the theory and technique of CPR have not generally been taught in universities within China (Chen et al., 2011; Qu, 2012; Zhang et al., 2011), and many students have a very poor understanding of resuscitation principles and most of them were unaware of the existence of CPR training courses for the general public (Cao and Yan, 2013; Chen et al., 2006; Gu, 2012). Therefore, because a prerequisite of performing successful CPR is knowledge of how to do it, promoting the willingness of university students to learn the theory and technique of CPR and to teach it to others will contribute to improving the rate of bystander CPR in China.

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In this study, we investigated the attitudes of Chinese university students toward performing CPR in 10 different theoretical situations and their attitudes toward performing chest compression plus mouth-to-mouth ventilation (CCMV) versus CC alone, as well as their attitudes toward learning and disseminating bystander CPR. This paper attempted to explore both the factors influencing the attitudes toward CPR and the reasons for being unwilling to perform bystander CPR.

## 2. Background

In order to increase the number of individuals among the public trained in CPR, introducing CPR training into schools has been widely recommended as a long-term strategy to educate the wider community. However, the ultimate aim of any basic life support (BLS) training course is not just to equip the health care providers (Brenner et al., 1997; Jelinek et al., 2001; Shibata et al., 2000) and lay rescuers (Johnston et al., 2003; Shibata et al., 2000) with the knowledge and skills to perform CPR, but to actually have people who are willing to perform bystander CPR in real emergency situations (Jelinek et al., 2001; Spooner et al., 2007). Having people with positive attitudes toward bystander CPR so reducing time lost by hesitation to initiate bystander CPR in real emergency situations is significantly important because the time taken from the activation of the emergency medical services to the time when they arrive at the scene is longer than the critical first 5 min (Eisenberg et al., 1990). That time is of utmost importance in improving the chance of survival of a cardiac arrest victim (Cummins et al., 1991; Stiell et al., 2004) as every minute delay without the initiation of CPR will decrease the chance of survival by 2.3% (Larsen et al., 1993).

Several studies have assessed students' attitudes toward bystander CPR (Al-Turki et al., 2008; Chew and Yazid, 2008; Ge, 2005; Hamasu et al., 2009; Hubble et al., 2003; Kanstad et al., 2011; Leila et al., 2007; Omia et al., 2008; Parnell et al., 2006). The use of automated external defibrillator (AED) has been considered as a type of bystander CPR in some studies as AEDs are increasingly present in public areas in some developed countries (Hubble et al., 2003; Leila et al., 2007), but this is not the case in most developing countries including China. Realistic hypothetical cardiac arrest scenarios depicted in literature or by video are an ideal research tool equating to the actual situation, which has been used in several studies. These results indicated that when presented with realistic hypothetical cardiac arrest scenarios, the respondents were more willing to rescue their relative, a close friend, a strange child than victims who appeared unkempt or traumatized, and the rates of being willing to perform CCMV and CC were very different across the different studies conducted in different areas (Chew and Yazid, 2008; Hubble et al., 2003; Kanstad et al., 2011; Omia et al., 2008). One Chinese study indicated that of nursing students, 1.5% were reluctant to perform CPR on relatives, 14.1% to children, 41.8% to elderly persons, 41.8% to male strangers and 62.2% to traumatized victims (Ge, 2005). It was reported that Japanese and Malaysian students were more willing to perform CC than CCMV (Chew and Yazid, 2008; Omia et al., 2008). Several studies indicate that fear of incompetence, poor knowledge of resuscitation, fear of infection, legal consequences, fear of harming the person and anxiety that their efforts would fail to revive the victim contributed to students' unwillingness to perform bystander CPR (Chew and Yazid, 2008; Omia et al., 2008).

Bystanders who had previous experience of CPR training were more likely to perform CPR compared with those without previous CPR training (Swor et al., 2006; Tanigawa et al., 2011). Questionnaire surveys before and after a BLS training course for Japanese college students also indicated that the proportion of students showing willingness to perform BLS increased after the training (Hamasu et al., 2009). Though the rate of the students receiving CPR training in China is lower than 15% (Chen et al., 2010, 2011; Zhang

et al., 2011), the reported attitudes of Chinese students toward learning about CPR (Cao and Yan, 2013; Chen et al., 2006, 2010, 2011; Lan et al., 2012; Zhang et al., 2011) and teaching it to others (Chen et al., 2010) were generally positive. Only one study of nursing students' attitudes toward performing bystander CPR using realistic hypothetical cardiac arrest scenario has been conducted in China (Ge, 2005). Moreover, except one study with a sample of 938, the samples of other domestic studies were small, ranging from 127 to 600. It is likely that college students of different specialties may differ in their attitudes toward performing bystander CPR, and there was no study focusing on this angle according to the searchable literature.

Therefore, we conducted a structured, voluntary, anonymous questionnaire survey to explore the attitudes among different specialties of college students in China toward performing, learning and disseminating CPR.

## 3. Methods

Tianjin, situated about 200 km SE of Beijing, is a metropolis in northern China with a population of about 7.52 million. There are 18 colleges and universities under the National Ministry of Education, one university under the national Civil Aviation Authority, 3 colleges and universities belonging to foreign institutions and one private college in Tianjin.

In China vocational specialties, e.g. medicine and teaching, are taught in monotechnic universities and so are not (or very minimally) represented in the more general universities which deal with other disciplines. For this reason the universities were selected based on the disciplines taught to give a mix of medical and non medical courses. Because the researcher visited the universities in person to administer the questionnaire with the participants in the classroom and collect them immediately on completion, it was necessary to select universities within a convenient traveling distance of our base. On the basis of our pilot study and the formula used to estimate the simple size recommended by Wang (2011), printed copies of questionnaires were distributed by the researchers who accessed the whole group of students in class, explained the purpose of the study and asked for volunteers. 30 copies of the questionnaire were given to volunteers from each grade of each specialty. Instruction for filling them in was given before distributing questionnaires. The subjects were required to independently finish the questionnaires within 15 minutes, and return them immediately to the researcher.

The questionnaire consisted of four sections. Section one asked for demographic information, including gender, age, grade and specialty. Section two used mock rescue scenarios to assess participants' attitudes toward performing CCMV or CC using scale of "definitely yes", "uncertain" and "definitely no" if they were actually faced with the situation in the scenario, this is shown in Table 1. At the beginning of this section respondents were given basic information about the principles and techniques of CPR and were asked to assume that for all ten scenarios they did in fact have this knowledge so that lack of knowledge was not an obstacle to performing bystander CPR.

In this second part, respondents were also instructed to choose the key reason for not performing bystander CPR. The third part aimed to identify the attitudes toward learning CPR. The fourth part was designed to assess attitudes toward disseminating theory about CPR. The readability and face validity of the questionnaire was tested by one expert in clinical first aid, one expert in the emergency center and one university lecturer who was teaching first aid. The advice on the appropriateness of each question was discussed within our group. Before the formal study, we did a pilot study using 30 questionnaires administered to the same population twice within a two week interval to check reliability and to make sure the questionnaires

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