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Simulation and education

Save-a-life at the ballpark: 10-min spectator training achieves proficiency in cardiac arrest response☆

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ABSTRACT

Objective: To determine immediate recall, feasibility, and efficiency of a brief out-of-hospital cardiac arrest (OHCA) bystander response training session at a large sporting event. We introduce two new measures of efficiency for training: (i) cardiac arrest training yield (CATY), i.e., number trained/number of spectators, and (ii) the training efficiency index for cardiac arrest (TEICA), i.e., persons trained per volunteer hours.
Methods: A convenience sample of baseball fans participated in a 10-min training on OHCA recognition, CPR and automatic external defibrillator (AED) use and completed post-training knowledge surveys.
Results: Out of 20,000 spectators, 198 participated for a CATY of 1%. Seventy-five volunteers over 3 h of training generated a TEICA of 0.88. 90% of respondents identified the proper rate of chest compressions. 90% of respondents recognized an AED's function; 98% recognized it was easy to use. 83% recognized chest compressions as the next step after calling 911 and 62% included AED as part of the OHCA response.
Conclusions: A 10-min training session is feasible and can achieve good recall in cardiac arrest response. However, participant recruitment dominated most of our volunteer effort. Our results can serve as a framework in the development of future health promotion campaigns.

1. Introduction

Out-of-hospital cardiac arrest (OHCA) claims 424,000 victims each year in the United States.[1] Striking geographic variation in OHCA outcomes closely follows rates of bystander cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) use.[2] The importance of community efforts to increase bystander response rates has been highlighted by the American Heart Association (AHA) leading to changes in the paradigm of educational campaigns.[3] Public awareness is considered equally effective and more cost-efficient than conventional certification courses to disseminate CPR awareness to large numbers of people.[4]

Traditional CPR and AED certification may discourage would-be trainees as it comes with a high cost of time and money.[5] CPR certification requires a certified instructor in a classroom setting and takes approximately 4 h to complete.[6] Although some studies have suggested that certified instructor-led training may be superior,[7,8] there is growing evidence to support alternative methods for bystander training.[9] Layperson instructors,[10] computer and video self-instruction,[11–13] and poster instruction[14] provide similar competence at a lower cost compared to traditional certification. There is also good evidence to support that laypersons need no formal training to operate an AED,[15] although brief training can lead to more rapid correct pad placement and shock delivery.[16,17] Whether mass CPR and AED training events provide adequate proficiency or are efficient to train large numbers of laypersons has not been well investigated.

2. Chicago Cubs CPR Day

The Illinois Heart Rescue Project (ILHR) is a multidisciplinary effort to increase survival for OHCA. On June 10, 2013, ILHR and Chicago Cubs baseball partnered to host the "Cubs Heart Rescue Day" at Wrigley Field. Baseball spectators were considered an important target audience for bystander response training because:

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(1) They are diverse with respect to age, gender, and race;
(2) Game attendance averages 31,500 spectators, providing an opportunity to reach a large audience and;
(3) Chicago Cubs are experienced with health promotion efforts, such as the 'Pink Out Day', an annual breast cancer awareness event held in partnership with Advocate Health Care Charitable Foundation.

The purpose of this study was to determine the efficiency, feasibility, and knowledge acquisition of a brief OHCA bystander response training at a large sporting event. Public health initiatives must be efficient to allow the best use of resources. We propose two new measures of CPR/AED training efficiency: (i) cardiac arrest training yield or CATY (number trained/number exposed) and (ii) training efficiency index for cardiac arrest or TEICA (persons trained/volunteer hour).

3. Methods

3.1. Study design, population, and participant recruitment

This was a survey of participants in a compression-only CPR and AED training program implemented during the Cubs Heart Rescue day. The target population was spectators of all ages attending the Cubs game at Wrigley Field in Chicago, IL, on 6/10/2013. The Office for the Protection of Research Subjects of the University of Illinois at Chicago approved the study protocol.

ILHR volunteers stationed at main entrances and major street corners surrounding Wrigley Field recruited spectators toward a training tent adjacent to the stadium. ILHR volunteers were a diverse group including middle and high school students, undergraduates, medical students, nurses, emergency medical technicians, and physicians. Volunteers had either completed a Basic Life Support (BLS) certification course or a 1-h ILHR training session including a lecture, demonstration of an AHA-approved training video, and practical session using mannequins and trainer AEDs. Volunteers advertised a free t-shirt for spectators who completed the training. Participation in this program was voluntary.

3.2. Procedure

3.2.1. Demographic data acquisition

Volunteers recorded gender, age, ethnicity, language preference, and zip code from participants. Provision of demographic data was voluntary and not required for training.

3.2.2. OHCA recognition and CPR and AED training program

Training was 10 min long and was adapted to reflect the content of validated self-instruction materials, such as Laerdal's CPR anytime kit and Chicago Cardiac Arrest Resuscitation Education Service (CCARES) training videos. Participants moved in groups of five through three stations set up in assembly line fashion. Two volunteers provided instruction at each station for a trainee to instructor ratio of 5:2 (Fig. 1):

Station 1: (4 min) Participants learned how to recognize an OHCA and reviewed the chain of survival: (1) shake/shout, no checking for pulse or breathing; (2) call 9-1-1; (3) start chest compressions; (4) tell someone to find and use an AED. Participants learned to assume that they are witnessing a cardiac arrest if the victim does not respond. Correct hand and body placement and proper depth and rate for chest compressions were demonstrated on a mannequin.

Station 2: (2 min) Participants learned how to follow voice prompts when using an AED and body landmarks for proper placement of pads on a mannequin. They had to demonstrate proper AED use before moving to the next station.

Station 3: (4 min) ILHR coached participants through an OHCA scenario. Participants kneeled next to individual mannequins and recited the check, call, and compress sequence. They practiced chest compressions at a rate of 100 beats per minute on mannequins with a built-in feedback mechanism that clicks and then unclicks with adequate pressure. Music with a beat of 100 per minute was continuously played to maintain compression rate.

3.2.3. Post-training survey and program evaluation

Participants were asked to complete a post-training survey (Appendix 1) consisting of recall questions, demographics, an open-ended question requesting their evaluation of the program, and an invitation to become part of our OHCA survivor network. All participants received a t-shirt and chain of survival reminder cards and were encouraged to contact ILHR to learn more about OHCA.

3.3. Statistical methods

Data are reported with descriptive statistics. Categorical data are presented as frequencies and percentages. Continuous data are presented as means and standard deviations. The primary knowledge outcomes were identification of the correct rate of compressions, AED function, and action in an OHCA scenario. Secondary outcome measures were (i) cardiac arrest training yield or CATY (number trained/number exposed) and (ii) training efficiency index for cardiac arrest or TEICA (persons trained/volunteer hour).

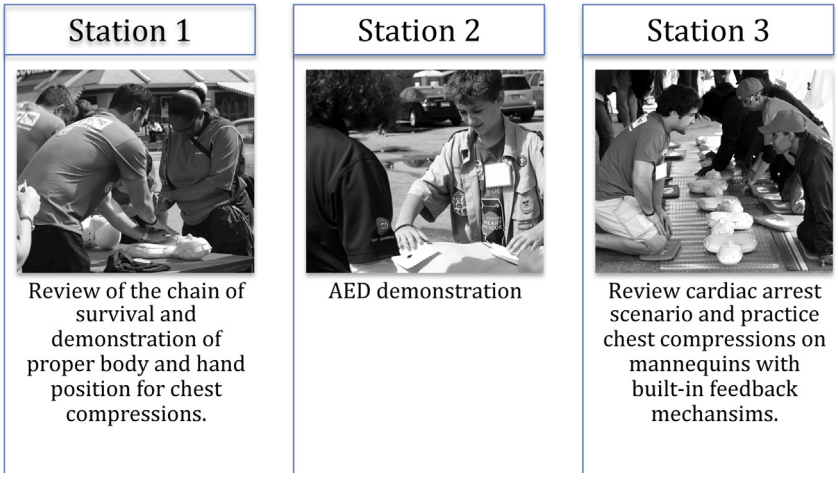

Fig. 1. Sudden cardiac arrest recognition and training in cardiopulmonary resuscitation (CPR) and automatic external defibrillator (AED) use.