HOSTED BY
ELSEVIER

Available online at www.sciencedirect.com
ScienceDirect
journal homepage: http://www.elsevier.com/journals/international-journal-of-nursing-sciences/2352-0132

Original Article

Effectiveness of combining manual external defibrillator and automated external defibrillator training for third-year nurse students

Jing-Jing Liu [a], *Li Gui* [a,*], *Zhuo-Min Chen* [a], *Kai-Yun Xu* [b], *Ying Li* [a], *Jing Zhang* [a], *Ling-Jun Zhou* [a]

[a] *Emergency Nursing Department, School of Nursing, 2nd Military Medical University, Shanghai, China*
[b] *Emergency Department, Changhai Hospital, Shanghai, China*

ARTICLE INFO

Article history:
Received 6 November 2014
Received in revised form
25 January 2015
Accepted 29 January 2015
Available online 6 March 2015

Keywords:
Automated external defibrillator (AED)
Manual external defibrillator (MED)
Minimal AED training
Nurse students
Training

ABSTRACT

Purpose: To assess the effectiveness of automated external defibrillator (AED) and manual external defibrillator (MED) training for third-year nurse students.
Methods: We conducted post-demonstration and post-practice evaluation for MED defibrillation, and pre-training, post-demonstration, and post-practice evaluation for AED defibrillation.
Results: Following MED training, time and confidence to defibrillate were improved significantly post-practice ($p < 0.001$, $p < 0.001$, respectively). In post-demonstration and post-practice evaluation, most students placed electrodes correctly (84.21% vs. 80.70%), cleared before defibrillation (75.44% vs. 89.47%), and performed cardiopulmonary resuscitation immediately after defibrillation (81.81% vs. 94.44%); the evaluations were not statistically different ($p = 0.806$, $p = 0.094$, $p = 0.198$, respectively). For AED training, time and confidence to defibrillate post-demonstration and post-practice were significantly improved ($p < 0.001$ vs. $p < 0.001$; $p < 0.001$ vs. $p < 0.001$, respectively) compared to that of pre-training; there was no obvious difference between the post-demonstration and post-practice evaluation ($p = 0.235$, $p = 0.346$, respectively). Post-AED demonstration, most students could place electrodes correctly (85.96%), clear (91.23%), and perform CPR immediately after defibrillation (85.96%), which remained at a high level post-practice (94.74%, 85.96%, 82.46%, respectively); there was no significant difference between the two evaluations ($p = 0.203$, $p = 0.557$, $p = 0.776$, respectively).
Conclusion: Combining MED and AED defibrillation training is effective and feasible for third-year nurse students. Minimal training is effective for AED, while MED requires additional practice.

Copyright © 2015, Chinese Nursing Association. Production and hosting by Elsevier (Singapore) Pte Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

* *Corresponding author.*
E-mail address: guili2000@foxmail.com (L. Gui).
Peer review under responsibility of Chinese Nursing Association.
http://dx.doi.org/10.1016/j.ijnss.2015.01.011
2352-0132/Copyright © 2015, Chinese Nursing Association. Production and hosting by Elsevier (Singapore) Pte Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

Sudden cardiac arrest (SCA) is one of the most critical situations in public health. SCA incidence is quite high in both developed and developing countries, i.e. France, North America, and China [1–3]. Cardiopulmonary resuscitation (CPR) combined with defibrillation within 3–5 min of collapse can produce a survival rate as high as 49–75% [4,5]. Each minute of delay before defibrillation reduces the probability of survival to discharge by 10–12% [6,7]. In recent years, many researchers have focused on out-of-hospital cardiac arrest (OHCA), while in-hospital cardiac arrest (IHCA) has not received the same level of focused research [8]. As reported, one-third of in-hospital SCA cases are not appropriately defibrillated within the recommended time, i.e. within 3 min of arrest [9]. Documented survival rates for IHCA range from 0% to 42%; major studies report about 20% survival to discharge rates [10–13]. Moreover, survival rates are lower in general units than that in critical care areas [14]. Nurses are always the main force of medical staff to be involved in IHCA. A study indicated that almost every nurse would be willing to receive training in advanced cardiac life support (ACLS) [15]. Another study concluded that it is reasonable for nurse students to have an understanding of lifesaving clinical skills and the ability to perform procedures such as defibrillation before their clinical practice [16]. However, it was found that nurses' CPR and defibrillation skills, namely CPR-skills, are poor [17]. One study found that only 22.7% of nurse students felt confident about defibrillation [18]. As the role of nurses continues to expand, defibrillation should become an expected rather than extended nursing role [19]. The purpose of this study was to assess the effectiveness of defibrillation training on third-year nurse students.

2. Methods

2.1. Setting and participants

The training course was held at the Second Military Medical University (SMMU) skill centre in Shanghai, China. All third-year nurse students from SMMU were invited to participate in the study. They had learnt the theory of emergency nursing and had finished the study of the vast majority of specialised nursing courses, including medical and surgical nursing. None of them had used a manual external defibrillator (MED) or automated external defibrillator (AED) or had received prior training.

2.2. Training and evaluation

Considering the handling and safety of an AED, all participants were firstly asked to perform AED defibrillation without receiving any training or tips. Then, they attended a 1-h AED course and a 1-h MED course separately, which were conducted by four experienced instructors who had been engaged for more than 10 years in teaching basic life support and advanced life support skills. All participants took turns receiving training in six groups of eight and a group of nine. The instructors introduced the working principles of AED/MED and the key points of AED/MED application, and then demonstrated how to operate AED/MED. Immediately after demonstration, an evaluation was carried out in the same setting (post-demonstration). All participants practised AED and MED defibrillation separately for 30 min after demonstration. The third evaluation was conducted the day after all students had finished their practice (post-practice).

To ensure accuracy of evaluations, two reviewers recorded the performance of defibrillation together with a self-designed evaluation form. The time and confidence to shock, safety, and operation immediately after defibrillation were evaluated. The time to shock (in seconds) was counted from unzipping the defibrillator or switching on the defibrillator to pressing the button to shock with a stopwatch by a reviewer. Participants' confidence to shock was evaluated using 0–10 numeric rating scores (0 represents no confidence at all; 10 represents full confidence): low (0–4), medium [5–7], high [8–10]. The reviewer explained the scores and their meaning to the participants, and then participants were asked to self-evaluate their confidence to defibrillate before the performance. Safety was evaluated by whether participants had cleared everyone or not before shock.

2.3. Equipment

The Laerdal AED trainer and Metrax GmbH (PRIMEDIC™ Defi-B) MED were used. The AED guided users with voice prompts once it was switched on, and had diagram prompts on the electrode slices; the MED functions with manual paddles. A manikin was used for all scenarios and was placed on a standard-height bed.

2.4. Data analysis

Data were entered into SPSS17.0 statistical software. Descriptive statistics including proportions were calculated. Statistical significance was set at $p = 0.05$. Continuous data were analysed using Student's *t*-test or the Mann–Whitney *U*-test; categorical data were analysed using the chi-square test.

2.5. Ethical considerations

The study received ethical approval from SMMU, and oral informed consent was obtained from all participants. In addition, all participants were free to refuse study participation or to withdraw from the study at any time. The study was conducted on 23–25 June 2013.

3. Results

A total 57 complete data were collected from the students who participated in the training programme.

3.1. Time to first shock

For MED, the mean time to first shock at post-demonstration evaluation was 63.93 ± 19.44 s; post-practice, it was 42.67 ± 10.89 s. There was a significant difference ($p < 0.001$) between the two evaluations (Table 1).

Download English Version:

https://daneshyari.com/en/article/2655688

Download Persian Version:

https://daneshyari.com/article/2655688

Daneshyari.com