



Original Contribution

Very brief training for laypeople in hands-only cardiopulmonary resuscitation. Effect of real-time feedback



Violeta González-Salvado, MD ^{a,*}, Felipe Fernández-Méndez, RNs ^{b,c}, Roberto Barcala-Furelos, PhD ^{c,d,e,f}, Carlos Peña-Gil, MD, PhD ^{a,g}, José Ramón González-Juanatey, MD, PhD ^{a,g}, Antonio Rodríguez-Núñez, MD, PhD ^{c,d,g,h,1}

^a Cardiology Department, Hospital Clínico Universitario de Santiago de Compostela, SERGAS, Universidade de Santiago de Compostela, Santiago de Compostela, A Coruña, Spain

^b University School of Nursing, Universidade de Vigo, Pontevedra, Spain

^c CLINURSID Research Group, Universidade de Santiago de Compostela, Santiago de Compostela, A Coruña, Spain

^d School of Nursing, Universidade de Santiago de Compostela, Santiago de Compostela, A Coruña, Spain

^e Faculty of Education and Sport Sciences, Universidade de Vigo, Pontevedra, Spain

^f REMOSS Research Group, Universidade de Vigo, Pontevedra, Spain

^g Institute of Health Research of Santiago (IDIS), A Coruña, Spain

^h Paediatric Emergency and Critical Care Division, Hospital Clínico Universitario de Santiago de Compostela, SERGAS, Universidade de Santiago de Compostela, Santiago de Compostela, A Coruña, Spain

ARTICLE INFO

Article history:

Received 31 January 2016

Received in revised form 14 February 2016

Accepted 15 February 2016

ABSTRACT

Background: Bystander cardiopulmonary resuscitation (CPR) improves survival from out-of-hospital cardiac arrest, but rates and performance quality remain low. Although training laypeople is a primary educational goal, the optimal strategy is not well defined. This study aimed to determine whether a short training with real-time feedback was able to improve hands-only CPR among untrained citizens.

Methods: On the occasion of the 2015 World Heart Day and the European Restart a Heart Day, a pilot study involving 155 participants (81 laypeople, 74 health care professionals) was conducted. Participants were invited to briefly practice hands-only CPR on a manikin and were after evaluated during a 2-minute chest compression (CC) test. During training brief instructions regarding hand position, compression rate and depth according to the current guidelines were given and real-time feedback was provided by a Laerdal SkillReporting System.

Results: Mean CC rate was significantly higher among health care professionals than among laypeople (119.07 ± 12.85 vs 113.02 ± 13.90 min^{-1} ; $P = .006$), although both met the 100–120 CC min^{-1} criterion. Laypeople achieved noninferior results regarding % of CC at adequate rate ($51.46\% \pm 35.32\%$ vs health care staff ($55.97\% \pm 36.36\%$; $P = .43$) and depth ($49.88\% \pm 38.58\%$ vs $50.46\% \pm 37.17\%$; $P = .92$), % of CC with full-chest recoil ($92.77\% \pm 17.17\%$ vs $0.91\% \pm 18.84\%$; $P = .52$), and adequate hand position ($96.94\% \pm 14.78\%$ vs $99.74 \pm 1.98\%$; $P = .11$). The overall quality performance was greater than 70%, noninferior for citizens ($81.23\% \pm 20.10\%$) vs health care staff ($85.95\% \pm 14.78\%$; $P = .10$).

Conclusion: With a very brief training supported by hands-on instructor-led advice and visual feedback, naïve laypeople are able to perform good-quality CC-CPR. Simple instructions, feedback, and motivation were the key elements of this strategy, which could make feasible to train big numbers of citizens.

© 2016 Elsevier Inc. All rights reserved.

1. Introduction

Sudden cardiac death is for many individuals the first manifestation of cardiovascular disease (CVD), usually on the presence of an ischemic

substrate [1,2]. At least half of out-of-hospital cardiac arrests (OHCAs) are witnessed [3–6]. Although bystander initiation of cardiopulmonary resuscitation (CPR) and early defibrillation significantly increase survival compared with no CPR [3,6–10], rates of bystander initiated CPR remain worryingly low [11,12]. Therefore, training general population in basic CPR skills is a primary educational goal, as expressly noted in the current resuscitation guidelines [13,14].

Prompt delivery of high-quality chest compression–CPR (CC-CPR) provides critical perfusion to the heart and brain and may prevent defibrillable rhythm from degenerating into asystole [15]. It has been proven to be at least as effective as conventional CPR in the out-of-

* Corresponding author at: Cardiology Department, Hospital Clínico Universitario de Santiago de Compostela, A Choupana s/n. 15706, Santiago de Compostela, A Coruña, Spain. Tel.: +34 981 950 793; fax: +34 981 950 534.

E-mail address: violeta.gonzalez.salvado@sergas.es (V. González-Salvado).

¹ SAMID-II Network. RETICS funded by the PN I+D+I 2008–2011 (Spain), ISCIII-Sub-Directorate General for Research Assessment and Promotion and the European Regional Development Fund, Ref. RD12/0026.

hospital setting and easier to perform for untrained lay rescuers [16–20]. “Hands-only” CPR should be thus taught to all citizens as a minimum requirement [13] and it may be a good approach when presented in public campaigns or mass events, where information should be focused and clear.

Despite previous studies comparing a wide range of educational CPR strategies, the optimal training method is still to be defined. Overall financial, time, or motivational reasons are obstacles that limit citizens' access to standard CPR courses [13,21], and new cost-effective approaches are needed to reach general population. Recent studies have explored the usefulness of short training strategies, which have been suggested to be as effective as the former. Feedback [22–24], self-instructed learning [25,26], and competition [24,27] appear to be useful tools to strengthen CPR learning, although further research is needed to assess their impact on a real scenario.

In this study, we aimed to assess the usefulness of very brief practical training (<5 minutes) on a manikin to improve CC-CPR skills among naïve citizens. Simple instructions, real-time feedback, and motivation may have been the core elements of the proposed strategy.

2. Methods

2.1. Study design

The World Heart Day (29th September) and the European Restart Heart Day (16th October) are initiatives that aim to increase general awareness of the importance of cardiovascular prevention and cardiac resuscitation [28,29]. As part of these events in 2015, a number of activities to promote cardiovascular health and health education were organized at our hospital, targeted at both health care staff and general population. One of these was a CPR learning station organized at the hospital hall. Volunteer instructors among medical and nursery staff from the cardiology department and the intensive care unit provided simple explanations about the importance of initiating the chain of survival, the correct approach in case of cardiac arrest, and the use of the automatic external defibrillator. Besides, passing-by citizens and members from the health care staff had the chance to practice and test their ability to perform hands-only CPR on a Laerdal ResusciAnne manikin (Stavanger, Norway).

Participants volunteered to practice hands-only CPR on a manikin for 5 minutes and be after evaluated during a 2-minute continuous CC test. Data from technical performance were recorded by a Laerdal Computerized SkillReporting System and later analyzed.

2.2. Participants

Study participants were verbally recruited among citizens and members of the health care staff who passed-by the hospital lobby on the morning of these 2 event's days.

All participants gave their verbal consent to participate. No personal information that could lead to their identification was recorded. Volunteers were asked about their prior CPR training and health care people were asked about their professional status (doctor, nurse, medical or nursery student). Citizens with any prior CPR training, those younger than 18 years, and those who were unable to finish the 2-minute CC test were excluded.

2.3. CC-CPR training

Each participant was assigned to a Laerdal ResusciAnne manikin and one instructor. They were given brief explanations about the importance of early initiation of basic life support in case of a witnessed cardiac arrest in order to increase the patient's survival chances.

Simple instructions regarding hand position, compression depth, and rate according to the current resuscitation guidelines [30] were given by the instructors during 5 minutes of repetitive CC-CPR training.

Special emphasis was placed on the frequency of compressions, as participants were asked to remember and perform CC-CPR to the beat of popular song at 100 beats/min (La Macarena, by Los del Río) [31].

2.4. CC-CPR quality testing

Just after the training, participants were evaluated during a 2-minute continuous CC test. Four Laerdal ResusciAnne manikins with Wireless SkillReporter software version 1.1 were used to assess real-time technical performance of CC-CPR.

Good-quality performance was considered when the participant accomplished correct CC equal or higher than 70% [32,33] according to the current recommendations of compression depth (50–60 mm), rate (100–120 per minute), complete chest recoil, and correct hand position on the chest [30].

2.5. Study variables

The variables explored were age and a number of CPR quality metrics including total number of CC, mean CC rate (in CC per minute), mean CC depth (in millimeters), percentage of CC at adequate rate, % of CC at adequate depth, % of CC with correct hand position, and % of CC with full-chest recoil. Global quality of CC-CPR (QCPR) was calculated by the Laerdal SkillReporter software, using the standard algorithm, which combines % of CC at adequate and rate depth, % of CC with correct hand position, and % of CC with full-chest recoil, as shown in Fig. 1.

2.6. Statistical analysis

All statistical analyses were performed using SPSS for Mac, version 20 (SPSS Inc, IBM, Armonk, NY). Descriptive statistics included mean, SD, and 95% confidence interval. Levene test was used to assess the homogeneity of variances. Unpaired *t* test for continuous variables was used to compare differences between means between both groups. In all analyses, a significance level of $P < .05$ was considered.

3. Results

From the 159 recruited, 2 laypeople younger than 18 years as well as 1 participant in each group who had not completed the 2-minute test were excluded. The final sample included 74 health care professionals and 81 laypeople. Fig. 2 illustrates the flow diagram for our study. Participants' age and results of CPR quality metrics for both groups are shown in Table 1.

During the 2-minute test, both groups met the CC rate criterion of 100 to 120 min^{-1} , although the rate was higher among health care professionals (119.07 \pm 12.85 min^{-1}) vs laypeople (113.02 \pm 13.90 min^{-1} ; $P = .006$). Around half of the CC were delivered at the adequate rate (55.97% \pm 36.36% vs 51.46% \pm 35.32%; $P = .43$). Similarly, only around 50% of participants reached the recommended 50- to 60-mm compression depth in both samples (50.46% \pm 37.17% vs 49.88% \pm 38.58%; $P = .92$).

Regarding chest recoil, no significant differences were observed between health care staff (90.91% \pm 18.84%) and citizens (92.77% \pm 17.17%; $P = .52$). Similar results were observed for hand position (99.74% \pm 1.98% vs 96.94% \pm 14.78%; $P = .11$).

Overall, CC-CPR performance assessed by the QCPR formula as previously described was above the 70% goal for both groups. Slightly better but no significantly different results were achieved by the health care professionals (85.95% \pm 14.78%) vs laypeople (81.23% \pm 20.10%; $P = .10$). The results are graphically represented in Fig. 3.

4. Discussion

Cardiac arrest is a leading cause of death worldwide. Cardiovascular disease is the most frequent underlying condition, with coronary

Download English Version:

<https://daneshyari.com/en/article/3223113>

Download Persian Version:

<https://daneshyari.com/article/3223113>

[Daneshyari.com](https://daneshyari.com)