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Letter to the Editor

Basic life support: performance of cost-effective educational program in layperson training

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Cardiovascular diseases are amongst the main causes of death worldwide. Half of the 200.000 cases of cardiac arrest (CA) that occur in Brazil each year are out-of-hospital CA[1], and only 10% manage to survive[2]. Laypersons are known to potentially give assistance to CA victims until emergency medical service arrives, improving patient's outcome[3]. In this context, training layperson to provide initial care in medical emergencies is a valuable resource, but studies concerning Basic Life Support (BLS) training to this population are scarce. Therefore, medicine students of the Faculty of Medicine of the University of São Paulo (FMUSP) developed and applied a cost-effective method in an educational event during the 4th Surgical Mission Trip of the *Bandeira Científica* Project (an academic FMUSP extension) in 2016.

Therefore, the main objective of this study was to provide a cost-effective educational program for laypersons training on the approach of some emergencies, including cardiopulmonary resuscitation (CPR). Applying questionnaires to the activity participants also gave us assess to previous knowledge of this population on BLS, as well as the teaching method's efficiency.

Training of the participants involved six adapted scenarios of medical emergencies[4] during 90 minutes, including CPR, in accordance with the 2015 American Heart Association (AHA) Guideline[5]. The mannequins used in the activity[6] were made with PET bottles partially filled with water, shirts and newspaper. The participants answered a validated questionnaire before and immediately after training, with 9 questions that addressed knowledge about CA victim care, focused on compression-only CPR (7). Each question had a score ranging from 0 (incorrect) to 2 (correct), and total score was given in percentage. The questions evaluated concepts mentioned during the activity, specially five important ones in the approach of CPR emergency: "mouth-to-mouth rescue breathing not necessary", "risk of contamination", "compression technique", "emergency recognition" and "chest compression role"

A group of 101 people attended the event and approximately 68% were laypersons. Our statistical analysis revealed an overall performance improvement after training of all participants ($mean_{before}$: 62.7%, $mean_{after}$: 75.8%, $p<0.01$), mainly on the concepts "mouth-to-mouth rescue breathing not necessary", "risk of contamination"

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and "compression technique". An already high knowledge average before training is probably the explanation for the absence of a significant statistic improvement in the other two concepts, "emergency recognition" and "chest compression role".

It was interesting for us to compare the participants' performance according to their professional career, as we expected a better performance of health professionals. However, no statistical difference in knowledge between groups was observed before or after the activity (laypersons vs. health professionals, $p_{before} = 0.26$ and $p_{after} = 0.57$). This result may be a consequence of the difference between group sizes, which was smaller among healthcare professionals.

In conclusion, this study showed that the tools used in BLS training were efficient to expand participants' knowledge, even with low cost materials and short time dedicated to CPR training. We managed to teach important concepts regarding the lay rescuer, as recommend by AHA. However, we do not know the long-term impact of this intervention. As the Surgical Mission Trip is planned to take place every year in some Brazilian city, there will be plenty of opportunities to refine our tools and teaching methods in further studies.

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