Improving the quality of cardiopulmonary resuscitation by smartphone applications: a randomized study on practical skills

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PURPOSE OF THE STUDY:

Purpose of the study: Many smartphone applications have been developed to enhance cardiopulmonary resuscitation (CPR). We aimed to evaluate the quality of some current mobile apps for CPR in order to identify any critical issue regarding the acquisition of practical abilities.

MATERIALS AND METHODS:

We searched for CPR mobile apps in Google Play and Apple App Store and took into account the first four apps with Italian language on screen. From the end of 2016 to March 2017, CPR courses were held according to 2015 guidelines. 226 student nurses were randomized to use one of four smartphone app or no app. After training, instructors used the skill test form by Italian Resuscitation Council for a blind evaluation of practical abilities. The 16 items were grouped in 4 categories (A:Airways, B:Breathing, C:Circulation, D:Defibrillation) and summed in a total and four categorical scores. R statistical program was used.

RESULTS:

Overall, a significant difference exists among groups (Kruskal-Wallis test, $P < .001$). Pairwise comparisons using Wilcoxon rank sum test and Holm correction showed a very significant difference between no app and each app. However some differences were found also between apps. A Dunn test confirmed these results. Looking for differences in each category, apps do not affect "A" skills, increase "C" skills at the same level, improve "B" and "D" depending on the type of app.

CONCLUSIONS:

Smartphone apps significantly improve CPR quality, as regards practical abilities. However, not all categories of skill test enhance in the same way. "A" abilities do not improve using an app during training. On the other hand, existing apps are very effective in improving "C" abilities. A larger variability exists among apps regarding breath control and the use of defibrillator. Our study suggests the importance of training with apps for which an increase of many practical skills is documented.