Automated assessments with feedback for improving CPR skills: a randomised non-inferiority trial.

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ABSTRACT

Objectives

To investigate if medicine students achieve an equal cardiopulmonary resuscitation (CPR) skill level after repetitive testing with feedback compared to testing followed by computer-guided practice.

Methods

In a non-inferiority trial, 196 third year medicine students were randomised to repetitive testing (T) or testing with additional practice (TAP). Testing and practising took place in a self-learning station equipped with a manikin connected to a computer. Automated testing consisted of a two minutes CPR test followed by feedback and feedforward. In the TAP group, additional practice consisted of CPR exercises with computer voice feedback. To pass the test, students had to achieve a combined score consisting of ≥70% compressions with depth ≥50 mm and ≥70% compressions with complete release (<5 mm) and a compression rate of 100-120/min and ≥70% ventilations with a volume of 400-1000 ml. Skill retention was measured after six months. The margin for non-inferiority was defined as a 10% difference in proportions.

Results

After training the success rate in both groups was 96%: 99/103 (T) and 89/93 (TAP). After six months, 4 students were lost to follow up in each group. The success rate in the testing group was 26/99 (26%) and 33/89 (37%) in the TAP group. The difference in success rate was 11%, with a 95% CI ranging from -3% to 24%. As the upper bound of this 95% CI exceeded 10%, non-inferiority was inconclusive.

Conclusions

Both training methods were equally effective to improve skills. For skill retention, testing alone seemed less effective than testing followed by practice. The substantial skill decay in both groups indicates the need for more frequent assessment and retraining.