

## COMUNICAÇÕES ORAIS • CO01

# CPR Skills Self-Training With a Novel Automated-Feedback Device: Impact in Compressions Performance

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### Afilições

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## ABSTRACT

**Introduction:** Cardiopulmonary resuscitation (CPR) is a vital action that may double or quadruple the survival rate from cardiac arrest. Chest compressions are a basilar component of CPR and should be performed with high quality to improve patient outcomes.<sup>1</sup> CPR training promotes acquisition and maintenance of fundamental skills, although it can be time consuming and expensive. To overcome these limitations, several devices are available with automated feedback on the main components of compressions, including frequency, depth, hands positioning and chest recoil. The aim of this work is to study the impact of CPR self training using a novel automated-feedback device (CPR Personal Trainer<sup>2</sup>) in the compressions performance of healthcare professionals and students. A secondary objective was to evaluate the adherence of the target samples to self training.

**Methods:** An experimental pre-post study was implemented, with a convenience sample constituted by voluntary medical students (MS) from the Faculty of Medicine of the University of Porto and medical doctors (MD) and registered nurses (RN) from the the University Hospital Center of São João. Ethical approval was obtained prior to the study. CPR Personal Trainer was made available for a 6week self-training period at the participants work/study place allowing an easy access during shifts/classes. Before the study, all participants had a familiarization session with the device and were advised to train whenever they wish. Before and after the self-training period each participant performed 2 minutes of chest compressions in the device for performance assessment, namely frequency, depth, hands positioning and chest recoil. During the self-training period, the number of trainings, number of compressions and training time were recorded by the system.

**Results and Discussion:** Data was collected from 46 individuals: 12 MD, 17 RN, and 17 MS. During the self-training period participants spent, in total, 270 minutes using the device. Students participation was markedly higher than the healthcare professionals, averaging 12.2 training sessions versus 3.2 and 1.6 for RNs and MDs, respectively. Compressions performance scores (Table 1) showed improvements in all components, for all groups, with the exception of chest recoil. Of notice is that, for hands positioning, frequency and depth, the mean values of the post-tests are all within the recommended guidelines,

for all groups. Inter-group comparisons showed statistical significant differences in two components before the self-training, but no significant differences after. This indicates similar performance levels in all groups, after the self-training period (Figure 1).

**Conclusion:** CPR self-training with automated-feedback devices seems to be an adequate strategy for acquisition and maintenance of skills. Further investigation should explore the retention of these gains.

## REFERENCES

1. Resuscitation (2015) 95, 81-99.
2. Resuscitation (2018) 130, e107.

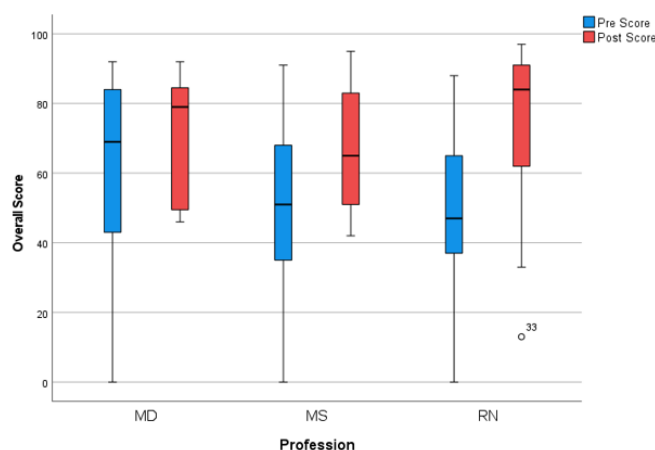


Figure 1. Pre and post test overall scores for chest compressions

## COMUNICAÇÕES ORAIS • CO01 (continuação)

Table 1. Pre and post test scores for chest compressions components (Mean±SD)

		Pre-test	Post-test	<i>p</i>
Hands Positioning (%)	MD	82.7 ± 38.3	98.8 ± 4.0	0.055
	RN	87.0 ± 32.3	100.0 ± 0.0	<b>0.034*</b>
	MS	88.0 ± 29.9	99.8 ± 1.0	0.069
	<i>p</i>	0.999	0.999	
Frequency (cpm)	MD	121.6 ± 11.4	105.5 ± 15.1	<b>0.025*</b>
	RN	140.8 ± 21.9	107.1 ± 25.2	<b>0.001*</b>
	MS	98.1 ± 18.5	105.9 ± 11.0	0.114
	<i>p</i>	<b>&lt;0.001*</b>	0.999	
Depth (cm)	MD	4.8 ± 1.0	5.6 ± 0.6	<b>0.049*</b>
	RN	4.7 ± 0.6	5.2 ± 0.7	<b>0.015*</b>
	MS	5.8 ± 0.4	5.4 ± 0.6	<b>0.018*</b>
	<i>p</i>	<b>&lt;0.001*</b>	0.999	
Chest Recoil (%)	MD	83.6 ± 34.2	67.8 ± 39.4	0.916
	RN	64.8 ± 36.3	82.6 ± 31.6	0.062
	MS	56.0 ± 38.7	58.2 ± 36.1	0.359
	<i>p</i>	0.273	0.267	

\*  $p < 0.05$ , statistically significant

Tests used: Kruskal-Wallis for independent samples (presented *p*-values adjusted by Bonferroni correction); Wilcoxon Sign Rank for paired samples, one-tailed.

MD – Medical Doctor (n=12); RN – Registered Nurse (17); MS – Medical Student (n=17);