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Letter to the Editor

Back to reality: A new blended pilot course of Basic Life Support with Virtual Reality

Sir,

Basic Life Support (BLS) and defibrillation are the basis of cardiopulmonary resuscitation (CPR). It is well established that bystander CPR, specifically chest compression and early defibrillation, is critical to survival in out-of-hospital cardiac arrest. Integration of quality CPR-feedback during BLS training has shown to improve learning outcomes compared to instructor-feedback only.[1] Virtual Reality (VR) is an innovative area of interest for CPR training.[2,3] Indeed, we demonstrated in a previous experience that VR is an adeguate tool for CPR training in comparison to a traditional mannequin.[4] Therefore, Italian Resuscitation Council (IRC) developed a new BLS blended course, called "Basic Life Support and Defibrillation, Quality CPR and Virtual Reality (BLS-D VRQ)"[5] with the aim to merge traditional training with quality CPR feedback mannequins and Virtual Reality environment. To enrich the learning experience, two different CPR feedback mannequins and two different VR devices with the same self-directed learning program were employed.

Two first pilot courses for lay people and healthcare professionals, respectively, were organized. Attenders were 9 for the lay course and 13 for the professional one. The course format was as follows: BLS lecture (30 min), BLS demo with quality CPR feedback (15 min), quality CPR training and VR experience (3 h). Three training stations were organized: the first used a Resusci Anne Q-CPR mannequin (Laerdal Medical, Stavanger, Norway); the second used a Brayden Pro manikins (Innosonian, South Korea); and the third had two different Virtual Reality CPR devices, the Vive VR headset by HTC (Nuova Taipei, Taiwan) with Valve Corporation (Bellevue, Washington, US) and the Oculus Go VR headset by Oculus VR (Facebook Inc, Menlo Park, California). Feedback from participants was collected: overall evaluation (appreciation score ranging from 1 to 10) showed a median value of 10 regarding Quality CPR experience, VR experience with both Vive and VR experience with Oculus Go. Specific evaluation about VR experience during courses was also collected (Likert scale 1–7, Table 1). The Quality CPR feedback and

Table 1 – VR experience evaluation. **Participants' feedback on VR experience. Participants rated the following statements using a 7-point Likert scale (1 = completely disagree, 7 = completely agree).**

	N	Yes	No
1. Did you have any previous experience of Virtual Reality?	22	4	18
	n	Median [range]	
2. It is very difficult to wear and use the VR setup	22	1 [1–7]	
3. It is difficult to perform chest compression with the use of VR setup	22	2 [1–7]	
4. I have the feeling that the patient is really present in front of me	22	7 [5–7]	
5. The patient presents the classical signs of cardiac arrest (unconscious, gasping, pale skin, etc)	22	7 [6–7]	
6. I have the impression to be in the real Bologna square and/or in a real hospital	22	7 [4–7]	
7. The environment of the Santo Stefano Square is very realistic	22	7 [5–7]	
8. The perception of the three-dimensional space is very high	22	7 [6–7]	
9. The interaction with the patient is very realistic	22	7 [5–7]	
10. The feeling of personal involvement in the resuscitation procedure is high	22	7 [5–7]	
11. The feedback received from VR CPR on my chest compression performance during the 2 minutes of CPR is clear	22	7 [3–7]	
12. VR CPR helps me to perform a chest compression rate between 100 and 120 compressions per minute	22	7 [5–7]	
13. VR CPR helps me to perform a chest compression depth between 50 and 60 millimeters	22	7 [4–7]	
14. I feel emotionally more involved when experiencing VR CPR training in comparison to the standard CPR manikin training	22	7 [6–7]	
15. I agree Virtual Reality will improve the results of CPR Training in the near future	22	7 [4–7]	
	N	Yes	No
16. Do you think that VR CPR should be implemented to improve effectiveness of healthcare personnel training?	22	22	0

Virtual Reality enrichment received an enthusiastic feedback from all participants. Unanimously, the Virtual Reality Experience was considered very immersive, with a very high sense of presence and with an effective feedback on participant skill performance. Thus, the new BLS-D VRQ course may be considered as an effective and acceptable alternative to traditional training courses. However, costs, equipment and initial instructor training must be acknowledged.

In conclusion, the BLS-D VRQ course is now an available exciting *reality*, no more a *virtual* ambition.

Conflict of interest

Federico Semeraro is Past-President Italian Resuscitation Council and BLS SEC Co-Chair of European Resuscitation Council. Giuseppe Ristagno is a ILCOR domain leader. Andrea Scapigliati is the President of Italian Resuscitation Council. Niccolò Brenno Grieco is Chair of IRC Scientific Committee. Silvia Scelsi is Chair of IRC Education Committee. GG, JSK, PC, LF, RT has no conflict of interest.

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BLS-D VRQ course is dedicated to the “next generation” lifesavers. Live Long And Prosper #LLAP to VR CPR.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.resuscitation.2019.02.034.

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