Suitability of a virtual reality simulator for laparoscopic skills assessment in a surgical training course.

Abstract:

Virtual reality simulators (VRS) can acquire specific performance parameters for laparoscopic surgery. The aim of this study was to evaluate the suitability of a VRS for the assessment in a surgical skills course. One hundred five attendees of a 7-day surgical skills course were tested with a VRS at the beginning (T1) and at the end (T2) of the course. Two standard VRS tasks (lifting and grasping (LG) and fine dissection (FD)) with two scores and 21 individual parameters were used. VRS performance was correlated to laparoscopic experience and experience in playing video games in order to assess the influence of preexisting skills. The participants improved significantly in both scores and in 19/21 VRS parameters between T1 and T2. Laparoscopic experts were significantly better than novices only for the parameter tissue damage on T1 in LG (41.4 %, P<0.001). Gamers were significantly better than non-gamers in all manual parameters on T1 in LG. Both groups of laparoscopic experience as well as non-gamers improved between T1 and T2 in LG for most parameters, while gamers only improved for tissue damage. The VRS was able to assess the gain in surgical performance during the course in general. However, laparoscopic experience and video game experience strongly influenced the results. Laparoscopic experience was correlated to the parameter tissue damage, whereas
video game experience was correlated to manual parameters. This knowledge can be used to build adequate scoring systems for VRS and to design tasks that target specific course skills.

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