Can virtual classroom training improve the acquisition of robotic training skills? A prospective, cross-over, effectiveness study (V-ROBOT)

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Introduction & Objectives: Robotic surgery has been widely adopted in several surgical specialties including major urological cancer surgeries. The Fundamentals of Robotic Surgery (FRS) curriculum was developed to address the lack of evidence-based standardisation in robotic training however, it is self-directed and non-interactive. We aim to determine the effectiveness of interactive, supplemental virtual classroom training (VCT) in conjunction with the FRS for robotic skills training.

Materials & Methods: 11 novice robotic surgical trainees were randomly assigned to two training groups. Both cohorts completed a one-week robotic skills induction. In week two, Group A trained under the FRS curriculum with adjunctive VCT; Group B trained only under the FRS curriculum. In week three, a cross-over was performed, and both groups received the alternative training programme of week two. The primary outcome was objective performance scores, quantified using the R-OSAT scoring system. This was collected post-intervention at the end of week two (time point 1) and end of week three (time point 2).

Results: All participants completed the three-week training programme. Both groups demonstrated significantly improved proficiency upon completion of the training programme, compared to at baseline. Participants attained higher mean proficiency scores with both the FRS curriculum and VCT training programme, compared to FRS training alone. At timepoint 1, Group A achieved a statistically significant greater mean proficiency score compared to Group B (44.80 vs. 35.33 points, p=0.006). At timepoint 2, there was no significant difference in mean proficiency score in Group A from timepoint 1. In contrast, Group B showed significant improvement in mean proficiency by 9.67 points from timepoint 1 (95% CI 5.18-14.15, p=0.003) once they had received VCT.

Conclusions: VCT is an effective training adjunct to the robotic FRS curriculum. We demonstrated higher mean proficiency scores attained upon completion of both the FRS curriculum and VCT training programme, compared to the FRS curriculum alone. Interactive, cost- and time-efficient, teaching should be used as an adjunct for robotic skills training.