

A brave new world: how important is the role of mentors in teaching surgical technique for intramedullary nailing of intertrochanteric fractures with the advent of virtual reality as an immersive learning tool? A randomised controlled trial

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INTRODUCTION:

Virtual reality (VR) simulation has emerged as an avenue for surgical training to supplement the limitations of conventional training methods. VR platforms offer the learner an opportunity to repeatedly undergo an immersive and interactive learning environment so as to achieve proficiency prior to performing a surgical procedure. With emerging literature demonstrating its importance in orthopaedic surgical training, we seek to determine if the role of mentors is still relevant in this age of technological advancement. This study aims to compare the procedural competency of the learner when trained by either a mentor or VR simulation alone, or a combination of both, in performing intramedullary nailing of an intertrochanteric fracture on a sawbone model.

METHODS:

Thirty first-year medical students without prior exposure to intramedullary femoral nailing were recruited and randomised equally into three groups to receive training by either a mentor or VR simulation alone, or a combination of both. In the mentor group, a fellowship-trained Orthopaedic consultant demonstrated to the participant the insertion of a short intramedullary femoral nail on a sawbone model. The VR simulation was based on the same procedure with the same steps taught by the mentor, using a commercial program from Osso VR. The participants then performed the procedure on a sawbone model after their respective training and were evaluated by blinded orthopaedic surgeons using a 5-point global assessment and rating scale, and a procedure-specific checklist.

RESULTS: Participants in the combined mentor and VR simulation group significantly performed better in terms of the aggregate global assessment score compared to the mentor and VR simulation group (13.2 vs. 9.7 vs. 5.4, $p < 0.05$). The percentage of steps completed correctly was also significantly higher in the combined group compared to the mentor and VR simulation group (42.5% vs. 2% vs. 0.2%, $p < 0.05$). Participants in the mentor group performed better for surgical steps that were more complex, although this was not significantly different compared to the other training methodologies.

DISCUSSION AND CONCLUSION:

A combination of mentor and VR simulation training proved to be the most effective in teaching the insertion of an intramedullary femoral nail to inexperienced medical students. VR simulation serves as an adjunct for learners to demonstrate proficiency in performing a surgical procedure, but is not effective as a standalone training tool. Mentors are still relevant in imparting surgical procedural knowledge but should supplement their training with VR programs to enhance the learner's procedural competency.