Reality Check: Virtual Reality Is Similar to Sawbones for Resident Training in Total Knee Arthroplasty

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INTRODUCTION:

Virtual Reality (VR) is gaining popularity as an effective and safe surgical education tool. No studies have evaluated VR in total knee arthroplasty (TKA). We aim to validate the procedural familiarity and psychomotor skills obtained by residents using VR versus traditional instrumentation sawbones (SB) in TKA.

METHODS:

All thirty residents in our program were randomized into two cohorts with equal post graduate year (PGY) distribution. The VR group utilized the Osso VR platform on Oculus Quest 2 headsets to simulate TKA using a standard industry knee system, while the control SB group performed TKA on sawbones with the same implant system. Each group performed 3 learning procedures prior to a final testing procedure on a sawbones model. Objective Structured Assessment of Technical Skills (OSATS) global rating scale, checklist of steps performed, procedure completion time, and accuracy of bone cuts and trial positioning were evaluated by a blinded fellowship-trained surgeon. Each resident participant completed an entry and exit survey.

RESULTS:

There was no difference in any of the OSATS global assessment categories between the VR or SB groups between junior (PGY 1-3) and senior (PGY 4-5) residents. Both SB juniors and seniors completed the test procedure faster (15.4 (2.1) vs. 20.7 (3.8) minutes, p=0.001; 12.1 (2.5) vs. 15.5 (3.5) minutes, p=0.041). SB juniors had a more accurate tibial implant size (7.2 (0.4) vs. 7.9 (0.3), p=0.001) and lateral tibial cut resection thickness (7.8 (1.4) vs. 10.6 (1.6) mm; p=0.0004). VR juniors had increased confidence in knowledge of TKA steps. Post-survey VR group experience: 1 neutral, 10 somewhat positive, 4 very positive.

DISCUSSION AND CONCLUSION:

VR in TKA allows for an equivalent level of technical skill acquisition in comparison to sawbones when measured using the OSATS global rating scale. Residency programs should continue to increase VR platform utilization as a means of surgical education.