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119 The Potential of Low-fidelity Arthroscopic Simulation Training in Trauma and Orthopaedic Surgery: A Systematic Review of Experimental Studies

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Aim: In an era of budget tightening and work-hour guideline reductions that have significantly reduced surgical exposure, low-fidelity arthroscopic simulators have an essential role to play in surgical training. The COVID-19 pandemic has only further amplified the need for alternative training models, as 91% of orthopaedic trainees have had elective procedures cancelled. The purpose of this systematic review is to synopsise the limited literature regarding the effectiveness of low-fidelity training models in the instruction of novices, and to formulate recommendations for future studies.

Method: The Embase, PubMed, Web of Science and Scopus databases were electronically searched. Studies from any year that described the use of orthopaedic, low-fidelity arthroscopic training models in novice populations were included. Questionnaires, case studies and review studies were excluded. Risk of bias assessments were also conducted for all studies.

Results: 16 studies were identified. Using the PRISMA algorithm, 6 studies were deemed relevant. A cross-study comparison revealed low-fidelity arthroscopic simulators reduced time to completion outcomes ($P < 0.05$), increased ASSET scores ($P < 0.01$) and confirmed face validity and transfer of skills (cadaver, live patients).

Conclusions: Low-fidelity simulator training significantly improves the arthroscopic performance of novices, without the high setup costs and practical constraints of high-fidelity equivalents. Low-fidelity arthroscopic simulators remain a promising training apparatus in an era of reduced surgical exposure (COVID-19). We have identified the need for consistent outcome measures with greater sample sizes across future studies. We recommend the use of standardised pre-intervention teaching (e.g., ABOS curriculum) and further transference, construct, and face validity evaluations to support future result interpretations.