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RESPONSE TO LETTER

Response to "Transfer of Laparoscopic Skills from Box Trainer Simulation to Real Life: A Bi-Center Study in Pakistan" [Response to Letter]

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Dear editor

We thank the authors for their thoughtful "letter to the editor" on our work,[1,2] and we concur that a "ceiling effect" may partly explain nonsignificant results for very simple psychomotor tasks. In our cohort, residents initially demonstrated low Global Operative Assessment of Laparoscopic Skills (GOALS) scores in real-life operative settings, despite achieving basic simulator proficiency, indicating that the translation of simulator-acquired skills to the operating room had not yet occurred. After our structured training, residents' real-life performance improved significantly. It remained stable, which we interpret as evidence of meaningful skill transfer rather than simulated proficiency without real-world application.

Importantly, recent literature underscores that simulation-based training indeed translates into improved operative performance in clinical settings. The multicenter randomized control trial (RCT) NOVICE trial reported that ex vivo basic laparoscopic skills training via box or VR-based curricula resulted in significantly higher GOALS scores during actual laparoscopic cholecystectomies compared with no additional training.[3] A comprehensive meta-analysis including 17 RCTs concluded that laparoscopic simulation significantly improves surgical skills, reduces operative time, and lowers error rates even among trainees with minimal prior experience, and that these skills are transferable to real-life OR settings.[4]

Moreover, simulation remains effective even in resource-limited settings when low-cost or low-fidelity tools are used. A 2025 multi-center randomized crossover trial demonstrated that low-cost laparoscopic simulators performed comparably to high-cost trainers in key tasks, including suturing and knot-tying.[5] In addition, a 2024–2025 study of a progressive multimodal training program (box trainers, VR, and ex vivo) demonstrated robust skill improvement and clinical translation among surgical trainees, underscoring the feasibility of structured training in variable resource environments.[6]

Taken together, these recent data reinforce our conclusion that structured simulation-based training Box Trainers (BTs), when well-designed and implemented, can lead to durable skill acquisition and successful transfer to real-life laparoscopic surgery, even in low- and middle-income countries (LMIC) settings. Given the limited availability of high-fidelity VR simulators in many LMIC institutions, our findings argue strongly for broader adoption of structured, cost-effective simulation training.

We acknowledge the limitations of our quasi-experimental design and the short (three-month) follow-up period, as well as potential biases in self-reported confidence and anxiety. Yet, the objective improvements in real-life GOALS scores, supported by contemporary evidence, suggest that our training model represents a valid, pragmatic, and scalable path toward improving laparoscopic training globally. We hope that the growing body of evidence, including recent high-quality trials and meta-analyses, will encourage institutions, especially in resource-limited settings, to invest in structured simulation curricula. Future studies with longer follow-up periods, randomized designs, and cost–benefit analyses are needed to substantiate these findings further.

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Disclosure

The authors declare no conflicts of interest related to this communication.

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