ORIGINAL RESEARCH

34. Near-Peer Teaching of Laparoscopic Skills Among Medical Students – A Randomized Feasibility Study

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https://www.youtube.com/watch?v=4rJ3DHWeKRs&list=PLhqNq3xJClbafO0Y5bvBcgMmXpgzJxd44&index=6&t=10618s

Background: Laparoscopic surgery is integral to modern surgical practice, with proficiency increasingly required across a range of specialties. However, many medical students graduate with limited exposure to essential skills. To address this, university surgical societies have adopted the "Near-peer" model to teach surgical skills. That is, senior or experienced medical students teach junior students basic surgical skills. However, the objective impact of this intervention remains under-evaluated. Furthermore, objective evaluation requires a comprehensive and validated assessment tool, which is currently lacking. The aims of this study were to develop a novel objective assessment tool, assess changes in students' confidence and objective performance in laparoscopic tasks following near-peer versus self-directed training, and explore factors associated with performance outcomes.

Methods: This single-blinded, randomised feasibility study enrolled 42 medical students without prior laparoscopic experience. Participants were assigned via computer randomisation to peer-taught (Group 1) or self-taught group (Group 2) and completed six weekly sessions across four laparoscopic stations: Ball Transfer, Circle Cutting, Peg Transfer, and String. Each of the peer-teachers had at least six months of peer-teaching experience and had completed an online teaching module. Performance was scored using a novel objective assessment tool developed through a Modified Delphi Method. In contrast to a traditional Delphi approach, a draft assessment tool was developed by the first author based on a literature review and preliminary framework. This was distributed to three experts in laparoscopic surgery and surgical education who provided structured feedback until unanimous consensus was achieved. The assessment domains of the novel assessment tool were unique for each station. Points were allocated for specific task anchors based on the performance quality of each step, alongside bonuses, deductions, and overall impression (Table 1). Two blinded surgical trainees independently assessed all performances. One-way Interclass Correlation was calculated for each station pre-intervention.

Results: No significant differences were observed in pre-intervention objective performance between groups, except for the "Peg Transfer" station. Post-intervention, the novel assessment tool demonstrated that both groups improved significantly across all tasks ($p<0.001$). Similarly, both groups' confidence improved significantly ($p<0.001$). The peer-taught group outperformed the self-directed group in "Circle Cutting" ($p=0.02$) and "String" ($p=0.01$). This study found no relationship between age, gender, or video game experience and performance outcomes. One-way Interclass Correlation was 0.845 for the pre-intervention "Ball Transfer" station, 0.897 for the "Circle Cutting", 0.951 for the "Peg Transfer", and 0.846 for the "String" station.

Conclusion: This is the first study to demonstrate that near-peer teaching of laparoscopic skills significantly improved laparoscopic performance among medical students compared with a control group. While the feasibility design limited generalisability, the results support the broader integration of near-peer teaching of laparoscopic surgical skills within the undergraduate setting. A multi-centre randomised controlled trial, powered on the effect sizes generated in this feasibility study is the essential next step to confirm efficacy. Furthermore, the validation of our novel assessment tool may offer a new gold standard for evaluating laparoscopic performance in undergraduate surgical education.

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