Communication Strategies for Introducing Novel Laparoscopic Instruments: A Pilot-Scale Randomized Control Trial to Improve Surgical Safety
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Introduction/objectives: Laparoscopy is a leading method in surgery, largely replacing open techniques in certain clinical scenarios. The tools of laparoscopy continue to evolve, however, challenging surgeons to acquire technical competence using a variety of instruments without extensive training. It is not unusual for surgeons to use a new instrument for the first time in an actual case, rather than initially deploying it in vitro. Previous studies have shown that inadequate technical proficiency in laparoscopy has a substantial negative effect on patient outcomes. Of the errors due to lack of technical competence, 58% were attributed to a deficiency in proper instrument training \cite{1}. As surgeons have limited dedicated, paid training time relative to the amount of information that would ideally be conveyed in a thorough training course, the underlying issue is ultimately communication-based: how can we effectively yet efficiently teach the use of a new instrument? The objective of the pilot-scale randomized control trial reported here is to test the effectiveness of a short, mixed-method training intervention in improving knowledge and technique with a specific laparoscopic instrument.

Methods: 42 medical trainees were randomized to standard training (ST, N=20) vs. enhanced training (ET, N=22). Both groups were shown instructional videos developed by the research team. The ST video (31s in length) demonstrated basic features of a recently developed laparoscopic instrument. The ET version (2:42s in length) included an advanced discussion of the instruments’ key features and incorporated safety information in the form of expert tips (e.g., “Heat is being generated at the lateral margins of the jaw, so be careful to protect the surrounding structures.”). Participants were then given a ten-question quiz and practice time with the instrument (1 min for ST, 5 mins with a live instrument and tissue sample for ET) followed by a standardized laparoscopic simulator assessment using the instrument on chicken skin models. Demographic information such as gender, age, and level of training was collected in a post-task survey.

Results: Quiz scores were significantly higher for ET participants (mean = 6.3/10) as compared to ST participants (mean = 4.1/10; \(P<0.01\)). ET participants’ simulator task times were also significantly faster than ST times (ET mean=113.4s, ST mean=186.7s; \(P=0.02\)). A significant negative correlation was noted between quiz scores and task times (\(P=0.01\)); i.e., participants that performed better on the quiz tended to complete the task faster. Level of experience, summarized as an index score based on participant answers to questions about their exposure to laparoscopic procedures, was not a significant predictor of quiz score or time taken in the simulator task.

Discussion/implications: This study demonstrates that a brief, structured training intervention improves both competence and efficiency on a laparoscopic instrument, suggesting that communication-based interventions designed to optimize cognitive proficiency and psychomotor skill in vitro may decrease morbidity associated with new devices in the operating room.

References: