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Development and evaluation of a simulation-based continuing medical education course: beyond lectures and credit hours

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Abstract

BACKGROUND: The aim of our study was to modify our previously developed laparoscopic ventral hernia (LVH) simulator to increase difficulty and then reassess validity and feasibility for using the simulator in a newly developed simulation-based continuing medical education course.

METHODS: Participants (N = 30) were practicing surgeons who signed up for a hands-on postgraduate laparoscopic hernia course. An LVH simulator, with prior validity evidence, was modified for the course to increase difficulty. Participants completed 1 of the 3 variations in hernia anatomy: incarcerated omentum, incarcerated bowel, and diffuse adhesions. During the procedure, course faculty and peer observers rated surgeon performance using Global Operative Assessment of Laparoscopic Skills–Incisional Hernia and Global Operative Assessment of Laparoscopic Skills rating scales with prior validity evidence. Rating scale reliability was reassessed for internal consistency. Peer and faculty raters' scores were compared. In addition, quality and completeness of the hernia repairs were rated.

RESULTS: Internal consistency on the general skills performance (peer α = .96, faculty α = .94) and procedure-specific performance (peer α = .91, faculty α = .88) scores were high. Peers were more lenient than faculty raters on all LVH items in both the procedure-specific skills and general skills ratings. Overall, participants scored poorly on the quality and completeness of their hernia repairs (mean = 3.90/16, standard deviation = 2.72), suggesting a mismatch between course attendees and hernia difficulty and identifying a learning need.

CONCLUSIONS: Simulation-based continuing medical education courses provide hands-on experiences that can positively affect clinical practice. Although our data appear to show a significant

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mismatch between clinical skill and simulator difficulty, these findings also underscore significant learning needs in the surgical community.

A commitment to continuous learning and practice improvement is essential in everyday clinical practice. However, the traditional implementation of continuing medical education (CME) allows course attendance and course credits to overshadow measured achievement and internal motivation for excellence. Continuing medical education is part of a rapidly changing system of professional development that includes assessment, remediation, and reassessment. Although jurisdictional requirements may vary from state to state, most simply require a number of hours of CME to be completed annually to satisfy licensure needs.[1] Currently, the larger focus for CME is the hours needed to maintain licensure and certification. However, the motivation behind the original development of CME programs was to inspire lifelong learning. With the increasing emphasis on quality in health care, CME has great potential to move from a basic focus on maintenance of licensure to improving quality in clinical practice and ensuring ongoing physician competence.

Although simulation has been widely accepted as a training and assessment modality in graduate medical education, use in CME is not as common. In addition, the external drivers for objective assessment of clinical skill during residency training are on the rise. Many of the residency review programs are requiring documentation of annual evaluations of skill in a hands-on setting, away from direct patient care.[2] These evaluations include assessments of knowledge, skills, and attitudes. However, after completion of training, these types of assessments are sparse. The exception is the newly implemented maintenance of certification program in the United States.[3] These programs, as defined by specialty board organizations, are bringing focus to the need for ongoing assessment after residency training.

In the medical literature, there is a paucity of research on the use of simulation-based technology in CME courses.[4,5] One study used a proficiency-based curriculum as part of a CME course. This group demonstrated the feasibility of a half-day CME course to improve performance in laparoscopic suturing.[6] The American Board of Anesthesia has also made some headway in developing simulation-based assessments for maintenance of certification. Overall, research in this field is largely based on self-report satisfaction data and lacks any standardized performance evaluation.[7]

The American College of Surgeons supports the use of simulation-based surgical education to enhance patient safety, meet the requirements for maintenance of certification and address the core competencies that all surgeons and trainees are required to achieve.[8] Despite the American College of Surgeons' support, development, implementation, and evaluation of simulation-based CME courses are lacking. To achieve these goals, valid and reliable measures of performance are necessary.

Our prior work using the laparoscopic ventral hernia simulator revealed the importance of intraoperative decision making for this procedure. This work underscored the need for decision-based metrics in addition to those used to assess technical skills.[9] The aim of our present study was to modify our previous laparoscopic ventral hernia simulator to increase difficulty and then reassess validity and feasibility for use in a CME course. Specifically, we sought to assess the following: (1) the validity and reliability of a previously developed procedure-specific (Global Operative Assessment of Laparoscopic Skills–Incisional Hernia [GOALS-IH]) rating scale and global (Generic GOALS) rating scale largely used for graduate medical education and (2) to document validity support for simulated laparoscopic ventral hernia scenarios of increasing difficulty.

Methods

Setting and participants

This study was performed at the 97th Clinical Congress in San Francisco, California in 2011. The Clinical Congress is designed to provide individuals with a wide range of learning opportunities, activities, and experiences that will match their educational and professional development needs. Practicing surgeons attending the conference, who signed up for the hernia course, served as participants. Minimally invasive surgery–trained surgeons served as faculty raters. Participant data were collected over a 1 day period. The Northwestern University Institutional Review Board approved the study, and all participants provided informed consent.

Protocol

This was an evaluation study to assess the feasibility of creating a simulation-based CME course for practicing surgeons performing laparoscopic ventral hernia repairs. Course objectives included demonstrating (1) proper port placement strategies; (2) efficient and strategic adhesiolysis; and (3) effective mesh management.

The course was limited to 30 participants. Before beginning, participants were randomly placed into 10 groups of 3. Five groups worked simultaneously during the 1st half of the course. The 2nd cohort completed the task during the 2nd half of the course. Each group was assigned to 1 of the 5 faculty raters. While 1 participant performed a laparoscopic ventral hernia repair on 1 of the 3