Role of video self-assessment in laparoscopic simulation training: a randomized pilot trial

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BACKGROUND: Residency programs have implemented simulation training to compensate for reduced operating room exposure. Video recording is an educational tool that can be utilized for coaching, telepresence, and self-assessment during simulation training. Data is limited on the utility of video recording and self-assessment for laparoscopic training in Ob/Gyn residency programs..

OBJECTIVE: This study aimed to determine the role of video self-assessment as an educational tool in laparoscopic simulation training and to establish the feasibility of our study design for a larger randomized controlled trial.

STUDY DESIGN: This was a prospective pilot study with a parallel, randomized, trial design that occurred in the Department of Obstetrics and Gynecology at the Mount Sinai Hospital. Subject participation took place in a surgical simulation training room. A total of 23 subjects were recruited (7 medical students, 15 residents, 1 fellow) voluntarily. All participants completed the study. All the subjects completed a pretest survey. The surgical simulation room contained a single Fundamentals of Laparoscopic Surgery box trainer and video-recording station. For session #1, each participant performed 2 Fundamentals of Laparoscopic Surgery tasks (A, peg transfer; B, intracorporeal knot tie). Participants were video recorded during session #1 and were randomized to either receive or not receive their video recording. The video group (n=13) and control group (n=10) repeated the Fundamentals of Laparoscopic Surgery tasks 7 to 10 days later (session #2). The primary outcome was percentage change in completion time between sessions. Secondary outcomes were percentage change in peg and needle drops between sessions.

RESULTS: The participant characteristics (video vs control) were as follows: average training level (6.15 vs 4.90 years), self-assessment (1=poor, 10=excellent) of surgical skill (4.8 vs 3.7), and laparoscopic skill (4.4 vs 3.5). Training level was inversely correlated with completion time for tasks A and B (r, −0.79 and −0.87; P<.0001). Less experienced trainees required the maximum time allotted for each task in session #1 (A, 3; B, 13). Regarding the primary outcome, the video group improved less than the control group (A, 16.7% vs 28.3%; B, 14.4% vs 17.3%). After controlling for training level (residents only), the video group improved more in the primary outcome (A, 17% vs 7.4%; B, 20.9% vs 16.5%) and secondary outcomes (A, 0.0% vs −194.1%; B, 41.3% vs 37.6%).

CONCLUSION: Video self-assessment has a potential role in simulation training for obstetrics-gynecology residents. With key improvements, the feasibility of our study design was demonstrated in preparation for a future definitive trial.

Key words: laparoscopic surgery, minimally invasive surgery, residency, self-assessment, self-directed training, skills acquisition, surgical simulation training, video recording

Introduction

Over the past 25 years, minimally invasive surgery (MIS) has been the favored surgical technique because of improved patient and operative outcomes. Surgical residency programs are expected to incorporate training for traditional and MIS techniques within the same length of residency training (ie, 5 years for general surgery, 4 years for obstetrics and gynecology).[1,2] Furthermore, altered duty-hour restrictions and case-minimum requirements have limited on-site training for all surgical residents. Consequently, residency programs have implemented simulation training to compensate for reduced operating room exposure and increased demands in surgical proficiency while enhancing patient safety. Surgical simulation allows training in various settings, including residency education, maintenance of surgical skills, and reduced surgical case volume as was highlighted during the COVID-19 pandemic.[3,4] The COVID-19 pandemic further reduced clinical and surgical exposure, particularly in New

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The authors report no conflict of interest.

Informed consent was obtained from each study participant.

Institutional research board approval was obtained (HS#: 19-01346).

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Why was this study conducted?
This study aimed to determine the role of video recording and self-assessment in laparoscopic simulation training and the feasibility of our study design for a larger randomized controlled trial.

Key findings
Video self-assessment has a potential role in laparoscopic simulation training for surgical residents. The feasibility of our study design was established.

What does this add to what is known?
Video self-assessment is a potential educational tool for simulation training as a supplement to video coaching.

York State where a moratorium on all elective surgeries was mandated for approximately 3 months. The pandemic highlighted the role of simulation training in surgical residency program such as obstetrics and gynecology. The implications of reduced surgical volume for surgical trainees highlight the need for self-directed surgical simulation.

Surgical simulation is a multifaceted approach to training residents in various modes of surgery and is limited at times by the fidelity of the simulator to impart the required skill. The Fundamentals of Laparoscopic Surgery (FLS) is a comprehensive education program that has proven training effectiveness.[5,6] The program assesses a trainee's fundamental knowledge and basic technical skills of laparoscopic surgery, which include peg transfer, precision cutting, ligation loop, intracorporeal knot tie, and extracorporeal knot tie. The American Board of Surgery and the American Board of Obstetrics and Gynecologists require that all graduating residents pass the FLS program for board certification as of 2008 and 2018, respectively.[7,8] Consequently, residency programs should identify educational methods to optimize a trainee's technical skills in laparoscopy.

Video recording can be used for video coaching, video self-assessment, and telepresence. Recent randomized controlled trials in surgical education have shown the benefits of video recordings as an effective teaching intervention for medical students and surgical residents.[9–12] A systematic review by Augestad et al[13] showed the benefits of video coaching across various simulation platforms for medical students and surgical residents. However, video coaching requires dedicated commitment from an experienced surgeon and is rarely used in training programs.[14] Alternatively, the accuracy of self-assessment via video playback has shown correlation with trainee experience. A systematic review by Nayar et al[15] concluded that video self-assessment may be of benefit in surgical training for the acquisition of technical skills. Data on the use of video recording and self-assessment for FLS training in obstetrics and gynecology residency programs or graduate medical education for this specialty are limited.

Our educational initiative aimed to determine the role of video self-assessment in FLS training among obstetrics and gynecology trainees. We hypothesized that a trainee's ability to review the video recording of their FLS session will improve their FLS skills acquisition based on objective outcomes. A pilot study was implemented to ascertain the feasibility of our study design in preparation for a larger, randomized controlled trial.

Materials and Methods

Subject recruitment

Subject recruitment included medical students who rotated on their obstetrics-gynecology clerkship, obstetrics-gynecology residents, and subspecialty gynecology fellows within 2 academic hospitals (Figure 1). The inclusion criteria included any trainee within the obstetrics and gynecology department. The medical students were considered a convenience sample because they rotated monthly for their obstetrics-gynecology clerkships. Alternatively, the residents and fellows were the expected subjects of this study. No sample size calculation was performed because this was a pilot study focused on evaluating the feasibility of our study design. All subjects were notified of the study through e-mail correspondence and invited to participate. Additional correspondence occurred during academic and clinical sessions. Participation was voluntary and all enrolled subjects had the opportunity to forego participation at any time during the study. Dates of enrollment were from January to March 2020. Recruitment was curtailed because of the onset of the COVID-19 pandemic, which prevented researchers and subjects from interacting. Informed consent was obtained, and all data collected were deidentified. Institutional research board approval was obtained (HS#: 19-01346).

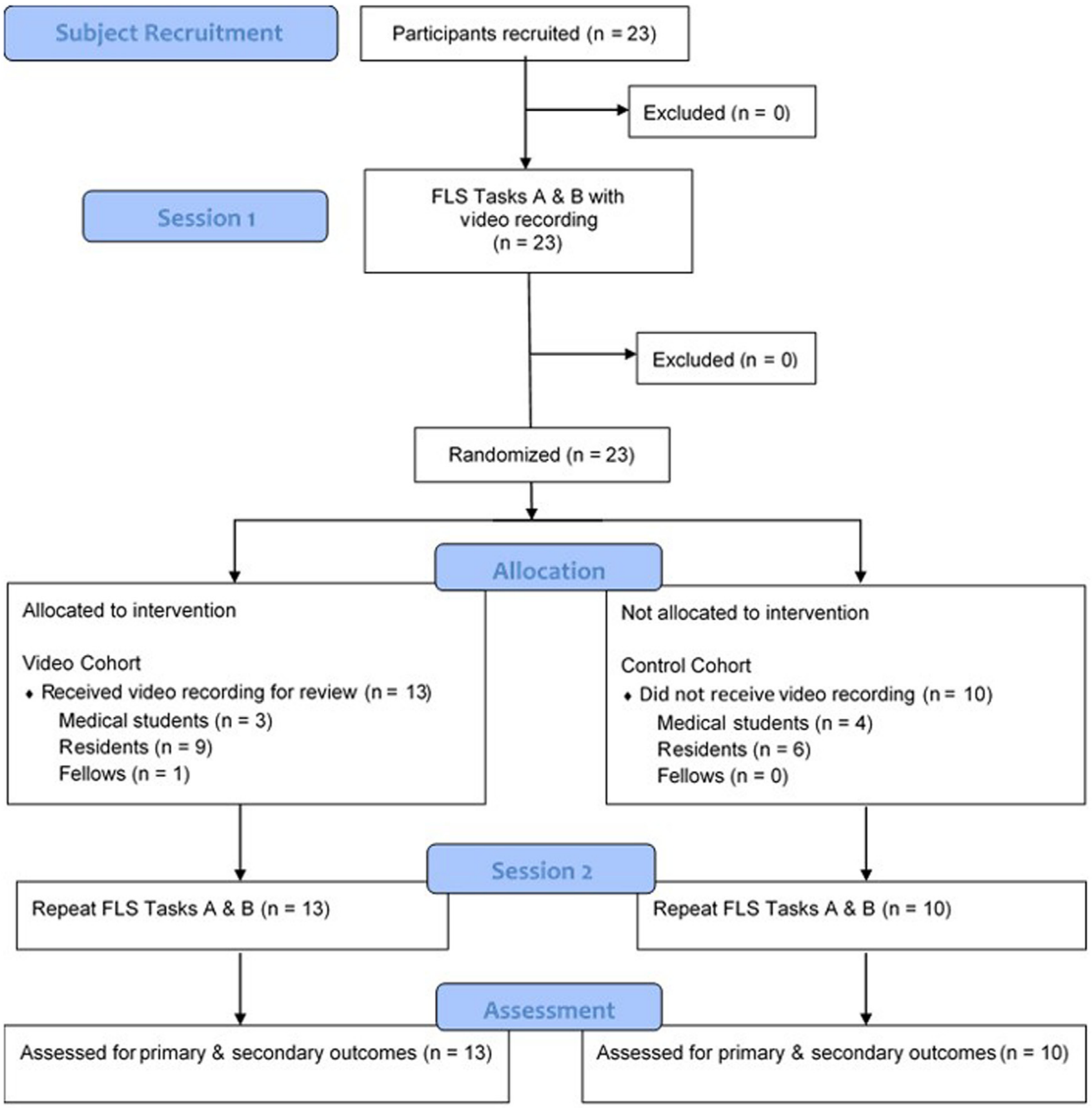
Pretest preparations

Pre- and posttest survey development. A pretest survey was developed by the study team to collect participant characteristics (Appendix A). A posttest survey was developed by the study team and used a 5-point Likert scale for evaluating the confidence in and attitudes and perceptions of the simulation activity (Appendix B). Survey responses were collected anonymously and entered into the Research Electronic Data Capture (REDCap) database.

Skilled proctor training. Structured training and standardized administration of the tasks were predetermined by the senior author (S.K.) and finalized in meetings with laboratory proctors (V.P. and S.S.) who were trained on the FLS tasks, the setup, and the study administration. Proctors were trained to allot the same method for each subject and to use a visible smartphone on a tripod to record the subjects' performance.

Pretest setup. Pretest setup included a survey, an instructional video, and

FIGURE 1
Flow chart and randomization of participants



FLS, Fundamentals of Laparoscropic Surgery.

FIGSE>Palvia. Video self-assessment in laparoscopic simulation. Am J Obstet Gynecol Glob Rep 2023.

familiarization with the FLS setup. All subjects completed a pretest survey (Appendix A) that was developed by the study team. Two FLS tasks were selected, namely the peg transfer task and the intracorporeal knot tie task. Peg transfer (task A) was selected because it can be performed by most novice trainees and the intracorporeal knot tie (task B) was selected because it requires a more advanced trainee (Figure 2). In addition, both tasks test different degrees of grasping and handling skills. Subjects reviewed an instructional video from the FLS program, which detailed the procedural steps of each task per the revised FLS guidelines.[16] All subjects had unlimited time to review the instructional video before completing each task. Subsequently, subjects were familiarized with the FLS setup, including laparoscopic box trainer, instruments, and components for each task.

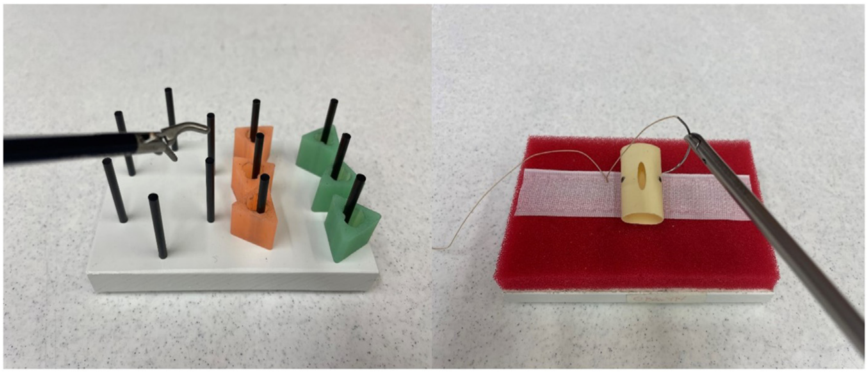
Outcomes

The primary outcome was percentage change in the completion time of both tasks measured in seconds. The secondary outcomes were percentage change in number of peg drops for task A and the percentage change in the number of needle drops for task B. A decrease in completion time, peg drops, and needle drops between sessions was considered an improvement in performance.

Testing—session #1

For session #1, all subjects were video recorded and allotted 300 seconds to complete task A and 600 seconds to complete task B as per the FLS guidelines.[16] No video or audio information

FIGURE 2
Simulation training tasks



Left, peg transfer task (task A). *Right*, intracorporeal suture tie (task B).

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was recorded that could identify any subjects. All recordings were of the simulation box contents only. Subjects were given basic, standardized prompts as needed to complete the tasks as per the FLS guidelines. After completion of each task, data for all outcome metrics were recorded in REDCAP for session #1.

Randomization

A parallel design was implemented for the randomization study. Randomization occurred after completion of session #1. Each subject was randomized to either receive their video recording (video cohort) or to not receive their video recording (control cohort). Randomization with allocation concealment was completed via a computerized random number generator through REDCAP. An intended 1:1 allocation ratio was implemented.

The video cohort were instructed to review their video recording for self-assessment before session #2. Videos were provided through a secure and encrypted, end-user private messaging application. Both cohorts had unmonitored access to the simulation training room before session #2, which was completed 7 to 10 days later.

Testing—session #2

All subjects completed task A and task B for session #2. Pretest preparations were not repeated. Data for all outcome metrics were recorded in REDCAP. A posttest survey was completed by each participant and recorded in REDCAP (Appendix B). No changes were made to the trial design after the pilot trail commenced.

Statistical analysis

In the setting of a pilot study, a sample size calculation was not completed, and statistical analysis was limited. Comparisons were done using nonparametric, 2-sided Wilcoxon signed-rank tests. Descriptive comparisons between groups were reported as mean values.

Results

A total of 23 subjects participated in the study. Further enrollment was halted because of the restrictions on research and group gatherings during the initial COVID-19 pandemic peak in New York State. Demographics and participant characteristics were gathered from the pretest survey (Table 1). The video cohort (n=13) had a higher average training level and self-assessment of laparoscopic and surgical skill than the control cohort (n=10) (P=.30, .47, and .49, respectively). Self-assessment of skill (1=poor, 10=excellent) was highly correlated with training level (Figure 3). The pretest survey was completed by all participants.

Lower-level trainees had longer completion times for task A and task B during session 1. Maximum time was needed by 3 subjects for task A and 13 subjects for task B during session 1, which indicated that the task was not completed. Regarding the primary outcome, lower-level trainees demonstrated greater improvement in the time between sessions for task A (P=.0002), but not for task B (P=.41) (Figure 4). For both tasks, the control and video cohort demonstrated improvement in the completion times (Figure 5). When compared with the control cohort, the video cohort completed both tasks more quickly in both sessions. However, the greatest improvement was demonstrated by the control cohort for both tasks between sessions. Regarding the secondary outcomes, the video cohort had an increased number of peg drops, but a decreased number of needle drops between sessions. The control cohort had no change in the drops for either task (Table 2).

Surgical training level was controlled for by removing all nonresident participants. Participant characteristics are shown in Table 3. After controlling for training level by including only residents (n=15), the video cohort (n=9) performed better than the control cohort (n=6) across all outcome metrics in terms of percentage change between sessions (Table 4). The completion time was quicker in the video cohort for both tasks during both sessions. The video cohort's completion time improved more than the control cohort for both tasks, although neither difference was statistically significant (P=.62 and.85, respectively). Although the video cohort had more peg drops and needle drops in session 1, they performed better than the control cohort when the sessions were compared (Table 4).

Most participants agreed (87%; n=20) that the simulation activity was enjoyable, and 91% (n=21) agreed that the simulation activity would help them in their clinical rotations. In the video cohort, 62% (n=8) of participants agreed that video self-assessment was helpful. In the control cohort, all (n=10) participants agreed that video self-assessment would have been beneficial. Results of the posttest survey are reported in Table 5.

Discussion

Our educational initiative aimed to optimize surgical simulation training

TABLE 1
Characteristics of all participants as determined by the pretest survey

Pretest survey	Video cohort (n=13)	Control cohort (n=10)
Age (mean)	29.08	28.70
Male (%)	3 (23)	1 (10)
Female (%)	10 (77)	9 (90)
Medical students (%)	3 (23)	4 (40)
Residents (%)	9 (69)	6 (60)
Fellows (%)	1 (8)	0 (0)
Training level (mean)	6.15	4.90
Right-handed (%)	10 (77)	10 (100)
Left-handed (%)	3 (23)	0 (0)
Sports (%)	9 (69)	8 (80)
Knitting (%)	1 (8)	3 (30)
Video games (%)	4 (31)	5 (50)
Board games (%)	7 (54)	8 (80)
Cooking (%)	9 (69)	8 (80)
Using tools (%)	4 (31)	4 (40)
Musical instrument (%)	7 (54)	9 (90)
Painting or drawing (%)	1 (8)	4 (40)
Surgical skill level (mean)	4.77	3.70
Laparoscopic skill level (mean)	4.38	3.50

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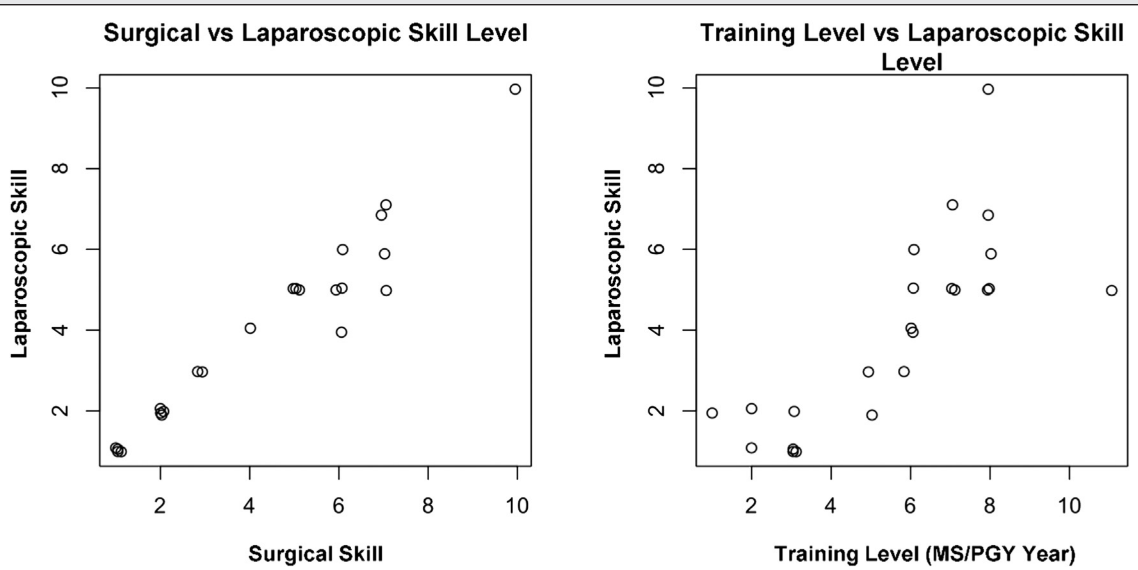
by determining the role of video self-assessment. The need for improvements in simulation training were highlighted during the COVID-19 pandemic during the elective surgery moratorium in New York State. In addition, we evaluated the feasibility of our study design for a larger randomized controlled trial. With key adjustments to our methodology, our study design established the feasibility to allow for continuation of our educational initiative. The results of our pilot study suggest that video self-assessment can potentially serve as an effective teaching model for residency training. Cost-effectiveness, accessibility to all trainees, and independent self-assessment are key components of this teaching model, which may confer the lifelong lesson of continuous independent review and self-improvement in surgical skills acquisition.

Video coaching has shown to be an effective teaching tool in simulation and surgical training.[11–13] However, video coaching is labor intensive and requires the dedicated time of an attending or mentor, which may not be accessible in all training programs. With advancements in smartphone technology and its accessibility in medical education,

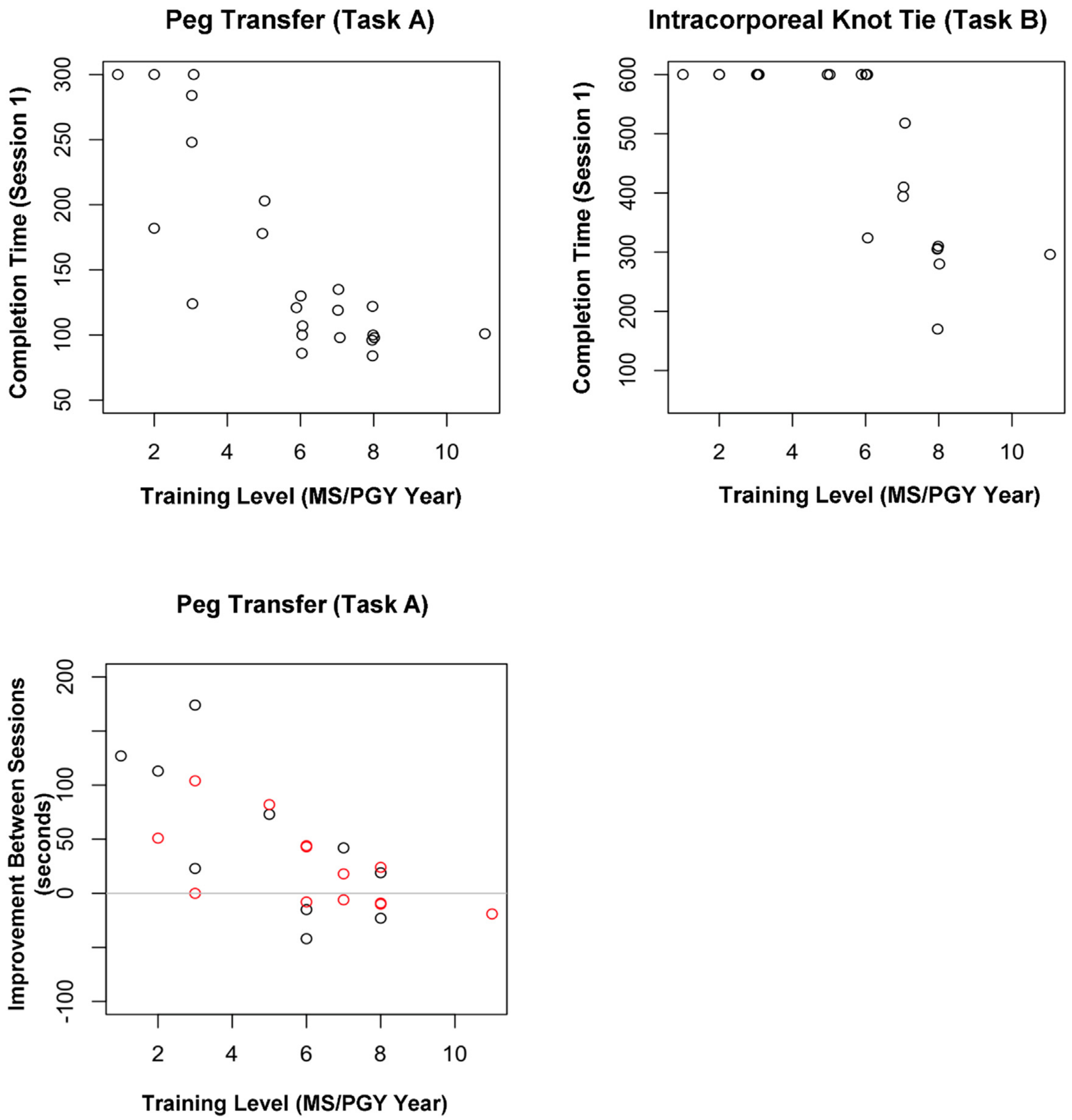
FIGURE 3
Self-assessment of laparoscopic and surgical skill



MS, medical school; *PGY*, postgraduate year.

FIGSE>Palvia. Video self-assessment in laparoscopic simulation. Am J Obstet Gynecol Glob Rep 2023.

FIGURE 4
Completion time by training level.



Top, completion time (seconds) by training level for peg transfer (*left*) and intracorporeal knot tie (*right*) during session 1. *Bottom*, improvement in completion time (seconds) by training level between sessions for peg transfer task. *Red circles* indicate the data for the video cohort. *Black circles* indicate the data for the control cohort.

MS, medical school; *PGY*, postgraduate year.

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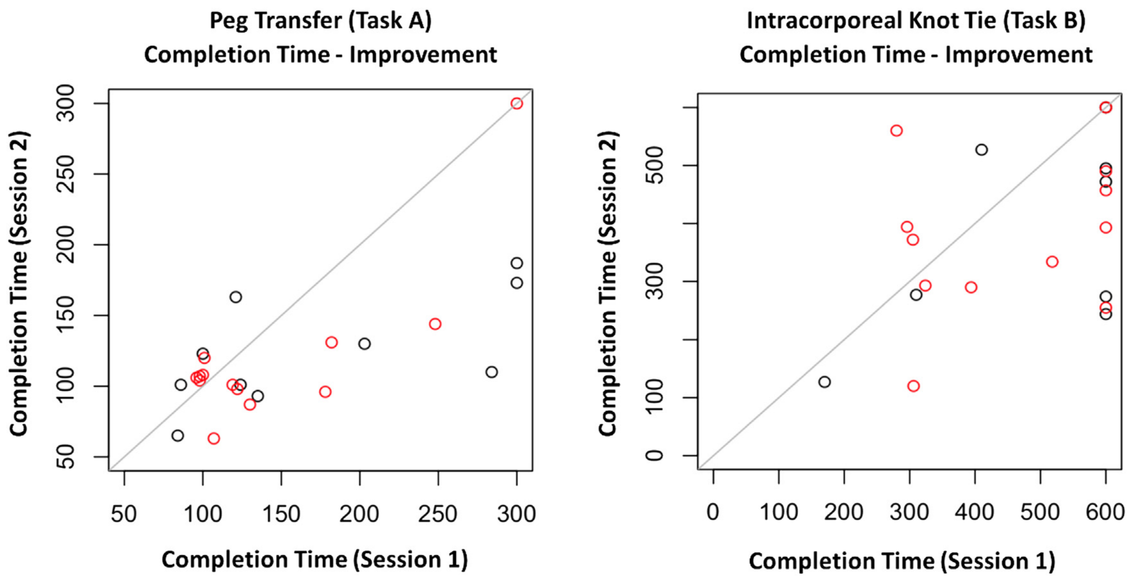
video self-assessment is a tool that can help with continuous improvement and lifelong learning. Currently, there are limited data on the role of video self-assessment in surgical training, which requires less resources and less time commitment by residents and attendings.[15,17] Our study serves as a preliminary report on the role of video self-assessment within a comprehensive curriculum in obstetrics-gynecology surgical training.

Video self-assessment is an attainable skill that can be further enhanced by surgical video coaching. However, we acknowledge that a certain level of expertise is needed to benefit from this educational method. Consequently, participation of medical students should be reevaluated because they were more likely to not complete either task. Video self-assessment can be instituted as part of surgical training programs or for continuation of surgical education beyond postgraduate training.

Strengths and limitations

Our study demonstrates several strengths. The objective of our pilot

FIGURE 5
Improvement in completion time for each task.



Improvement in completion time (seconds) for peg transfer (*left*) and intracorporeal knot tie (*right*) during both sessions. *Red circles* indicate the data for the video cohort. *Black circles* indicate the data for the control cohort.

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study was to establish the feasibility of the study design for a larger trial, which was achieved. A secondary, unintentional finding was identified because of the COVID-19 pandemic in New York State. The pandemic highlighted the need for surgical simulation in settings where procedures were halted and surgical education was disrupted. Consequently, this study explored the role of independent simulation training and skills acquisition in limited-resource settings, and this warrants further study to validate its function in surgical education. We used 2 FLS tasks (peg transfer and intracorporeal knot tie) that evaluated different degrees of grasping and handling, which are essential skills in laparoscopy. The selected FLS tasks simplified our methodology and prevented redundancy of skills testing with the extracorporeal knot tie and precision cutting. The selected outcomes of our pilot study (completion time, peg drops, and needle drops) were easily and objectively tracked with the aid of video-recording review. Finally, our study contributes to an area of simulation training that previously lacked evidence.[13,15]

Some limitations of this study include the inherent small sample size, although it was a highly skilled population and the relevant target audience for surgical simulation. A larger sample size will reduce characteristic differences between the video and control cohorts. Similar studies have used comparable study sample sizes.[11,12,18] Subject

TABLE 2
Percentage change in the primary and secondary outcomes of all participants between sessions for both tasks

	Peg transfer (task A)				Intracorporeal know tie (task B)			
Primary outcome	Session 1	Session 2	Change	% Change	Session 1	Session 2	Change	% Change
Video (n=13)	144.54 s	120.38 s	24.16 s	16.7	463.30 s	396.80 s	66.50 s	14.4
Control (n=10)	173.70 s	124.60 s	49.10 s	28.3	509.00 s	421.00 s	88.00 s	17.3
Secondary outcome	Peg drops (task A)				Needle drops (task B)			
	Session 1	Session 2	Change	% Change	Session 1	Session 2	Change	% Change
Video (n=13)	0.54	0.85	−0.31	−57.4	2.30	1.30	1.00	43.5
Control (n=10)	0.50	0.50	0.00	0.0	2.30	2.30	0.00	0.0

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TABLE 3
Characteristics of all residents as determined by the pretest survey

Pretest survey	Video cohort (n=9)	Control cohort (n=6)
Age (mean)	29.44	29.67
Male (%)	1 (11)	0 (0)
Female (%)	8 (89)	6 (100)
Training level (mean)	6.78	6.67
Right-handed (%)	7 (78)	6 (100)
Left-handed (%)	2 (22)	0 (0)
Sports (%)	6 (67)	4 (67)
Knitting (%)	0 (0)	1 (17)
Video games (%)	2 (22)	2 (33)
Board games (%)	3 (33)	5 (83)
Cooking (%)	5 (55)	5 (83)
Using tools (%)	1 (11)	1 (17)
Musical instrument (%)	4 (44)	5 (83)
Painting or drawing (%)	0 (0)	3 (50)
Surgical skill level (mean)	5.78	5.00
Laparoscopic skill level (mean)	5.44	4.67

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recruitment should be limited to residents and should have an improved randomization process following stratification by postgraduate year. The role of simulation training for medical students who have less surgical training can be an area for further exploration separately. Fellows may have less room for improvement because of their higher level of training, but simulation training may play a role in their development of surgical coaching skills. Additional consideration includes controlling for potential confounders, such as monitoring access to simulation training between sessions, tracking access to their video recording, and providing structured guidance for self-appraisal of their own video recording. Correcting these confounders can simplify our study design in preparation for a larger, randomized controlled trial.

Conclusion and research implications

The COVID-19 pandemic impacted medical and surgical education and highlighted the need for a structured simulation curriculum. Video self-assessment has the potential to be an effective,

TABLE 4
Percentage change in primary and secondary outcomes for all residents between sessions for both tasks

	Peg transfer (task A)				Intracorporeal know tie (task B)			
Primary outcome	Session 1	Session 2	Change	% change	Session 1	Session 2	Change	% change
Video (n=9)	116.44 s	96.67 s	19.77 s	17.0	436.33 s	345.22 s	91.11 s	20.9
Control (n=6)	121.50 s	112.50 s	9.00 s	7.4	448.33 s	374.50 s	73.83 s	16.5
Secondary outcome	Peg drops (task A)				Needle drops (task B)			
	Session 1	Session 2	Change	% change	Session 1	Session 2	Change	% change
Video (n=9)	0.33	0.33	0.00	0.0	1.89	1.11	0.78	41.3
Control (n=6)	0.17	0.50	−0.33	−194.1	1.33	0.83	0.50	37.6

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TABLE 5
Posttest survey results

Posttest Survey	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I found this simulation activity enjoyable.	0	3	0	8	12
I feel this session will help me in my clinical rotations.	0	1	1	12	9
I think the format of this session was appropriate for the material taught.	0	0	0	12	11
If you were given access to review your video, then did you find the video helpful?	0	0	5	6	2
If you were not given access to review your video, would you find it beneficial to review your video?	0	0	0	7	3
	Too short	About right	Too long		
I think the length of this session was. . .	0	23	0		

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low-cost educational tool that can be implemented in simulation training and in the operating room. Its role will be further explored in the next phase of our educational initiative with implementation of an improved study design for a larger randomized controlled trial.

Highlights

- Advancements in surgical techniques, altered duty-hour restrictions, and updated case-minimum requirements have necessitated supplemental simulation training to meet surgical residency training demands.
- The implications of reduced surgical volume on surgical trainees highlights the need for self-directed surgical simulation.
- Video self-assessment has a potential role in laparoscopic simulation training for surgical residents.

With key adjustments, the feasibility of our pilot study was established in preparation for a larger randomized controlled trial. ■

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APPENDIX A

Pre-Test Survey

- **Age:** __________ **Gender:** Male or Female
- **Medical School status:** MS1 MS2 MS3 MS4
- **Post Graduate Year status:** PGY-1 PGY-2 PGY-3 PGY4 PGY-5 PGY-6 PGY-7
- **Are you predominantly right or left handed?**
  - ______ Right
  - ______ Left
- **If you are a current Ob/Gyn resident, what are your career goals after residency?**
  - ______ Female Pelvic Medicine & Reconstructive Surgery (FPMRS)
  - ______ Minimally Invasive Gynecologic Surgery (MIGS)
  - ______ Gynecologic Oncology
  - ______ Reproductive, Endocrinology & Infertility (REI)
  - ______ Family Planning
  - ______ Maternal Fetal Medicine (MFM)
  - ______ Generalist
  - ______ Other: ________________
- **If you are a current medical student, what are your career goals after medical school?**
  - ______ Surgical specialty (i.e.: general surgery, neurosurgery, orthopedic surgery, ENT, ophthalmology, plastic surgery, Ob/Gyn, urology, etc.)
  - ______ Non-surgical specialty (i.e.: internal medicine, pediatrics, psychiatry, radiology, family medicine, anesthesiology, emergency medicine, etc.

- **If you are a current Fellow, what fellowship are you in?**
  ______ Female Pelvic Medicine & Reconstructive Surgery (FPMRS)
  ______ Minimally Invasive Gynecologic Surgery (MIGS)
  ______ Gynecologic Oncology
  ______ Reproductive, Endocrinology & Infertility (REI)
  ______ Family Planning
  ______ Maternal Fetal Medicine (MFM)
  ______ Other: ______________
- **What is your personal assessment of your overall surgical skill level on a scale of 1 (poor) to 10 (excellent)?**
  Circle one value only.
  1 2 3 4 5 6 7 8 9 10
- **What is your personal assessment of your overall laparoscopic skill level on a scale of 1 (poor) to 10 (excellent)?**
  Circle one value only.
  1 2 3 4 5 6 7 8 9 10
- **Do you currently partake in the any of the following activities? (select any that apply)**
  ______ Sports
  ______ Knitting/Crochet
  ______ Playing video games
  ______ Playing board games
  ______ Cooking
  ______ Using tools (screwdrivers, wrenches, etc.)
  ______ Playing musical instruments
  ______ Painting or drawing
- **Have you ever had laparoscopic simulation training?**
  ______ Never
  ______ < 10 cumulative hours total
  ______ > 10 cumulative hours total

APPENDIX B

Post-Test Survey

• I found this simulation activity enjoyable				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
• I feel this session will help me in my clinical rotations				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
• I think the format of this session was appropriate for the material taught				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
• I think the length of this session was				
Too short		About Right	Too long	
• If you were given access to review your video, did you find the video helpful?				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
• If you were NOT given access to review your video, would you find it beneficial to review your video?				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

REFERENCES

1. Roberts KE, Bell RL, Duffy AJ. Evolution of surgical skills training. World J Gastroenterol 2006;12:3219–24.

2. Zendejas B, Brydges R, Hamstra SJ, Cook DA. State of the evidence on simulation-based training for laparoscopic surgery: a systematic review. Ann Surg 2013;257:586–93.

3. Khan KS, Keay R, McLellan M, Mahmud S. Impact of the COVID-19 pandemic on core surgical training. Scott Med J 2020;65:133–7.

4. Aziz H, James T, Remulla D, et al. Effect of COVID-19 on surgical training across the United States: a national survey of general surgery residents. J Surg Educ 2021;78:431–9.

5. Sroka G, Feldman LS, Vassiliou MC, Kaneva PA, Fayez R, Fried GM. Fundamentals of laparoscopic surgery simulator training to proficiency improves laparoscopic performance in the operating room-a randomized controlled trial. Am J Surg 2010;199:115–20.

6. Fundamentals of Laparoscopic Surgery. Fundamentals of laparoscopic surgery. 2021. Available at: https://www.flsprogram.org/about-fls/. Accessed August 23, 2021.

7. The American Board of Surgery. Training and certification. 2003−2021. Available at: https://www.absurgery.org/default.jsp?certgsqe_training. Accessed August 23, 2021.

8. Fundamentals of laparoscopic surgery (FLS); 1994−2023. Available at: https://www.abog.org/specialty-certification/surgical-skills-program-standard/fundamentals-of-laparoscopic-surgery-fls [Cited June 9, 2023].

9. Alameddine MB, Englesbe MJ, Waits SA. A video-based coaching intervention to improve surgical skill in fourth-year medical students. J Surg Educ 2018;75:1475–9.

10. Bochenska K, Milad MP, DeLancey JO, Lewicky-Gaupp C. Instructional video and medical student surgical knot-tying proficiency: randomized controlled trial. JMIR Med Educ 2018;4:e9.

11. Rindos NB, Wroble-Biglan M, Ecker A, Lee TT, Donnellan NM. Impact of video coaching on gynecologic resident laparoscopic suturing: a randomized controlled trial. J Minim Invasive Gynecol 2017;24:426–31.

12. Soucisse ML, Boulva K, Sideris L, Drolet P, Morin M, Dubé P. Video coaching as an efficient teaching method for surgical residents-a randomized controlled trial. J Surg Educ 2017;74:365–71.

13. Augestad KM, Butt K, Ignjatovic D, Keller DS, Kiran R. Video-based coaching in surgical education: a systematic review and meta-analysis. Surg Endosc 2020;34:521–35.

14. Bonrath EM, Dedy NJ, Gordon LE, Grantcharov TP. Comprehensive surgical coaching enhances surgical skill in the operating room: a randomized controlled trial. Ann Surg 2015;262:205–12.

15. Nayar SK, Musto L, Baruah G, Fernandes R, Bharathan R. Self-assessment of surgical skills: a systematic review. J Surg Educ 2020;77:348–61.

16. FLS Manual Skills Written Instrucitons and Performance Guidelines; 2014. Available at: https://www.flsprogram.org/wp-content/uploads/2014/03/Revised-Manual-Skills-Guidelines-February-2014.pdf. 2014.

17. Ward M, MacRae H, Schlachta C, et al. Resident self-assessment of operative performance. Am J Surg 2003;185:521–4.

18. Wittler M, Hartman N, Manthey D, Hiestand B, Askew K. Video-augmented feedback for procedural performance. Med Teach 2016;38:607–12.