

Surgical training during COVID-19: a validated solution to keep on practicing

Editor

Patient management has significantly changed since the COVID-19 pandemic appeared. Social distancing protocols, virus-free spaces, and telemedicine programs are now essential for clinical practice. The way surgery is performed also restructured to prioritize resources and keep teams safe from contagion¹⁻³. Surgical societies worldwide recommend performing only emergency procedures and minimizing the number of surgeons involved in patient care^{1,2}. These actions help controlling infection but also affect resident surgical volume.

Simulation-based education has emerged as the leading solution to train procedural skills when the exposition of residents to them is suboptimal or high risk. Feedback and deliberate practice are critical tools to learn, but many simulation centers

remain closed due to social-distancing protocols, thus stopping face-to-face feedback.

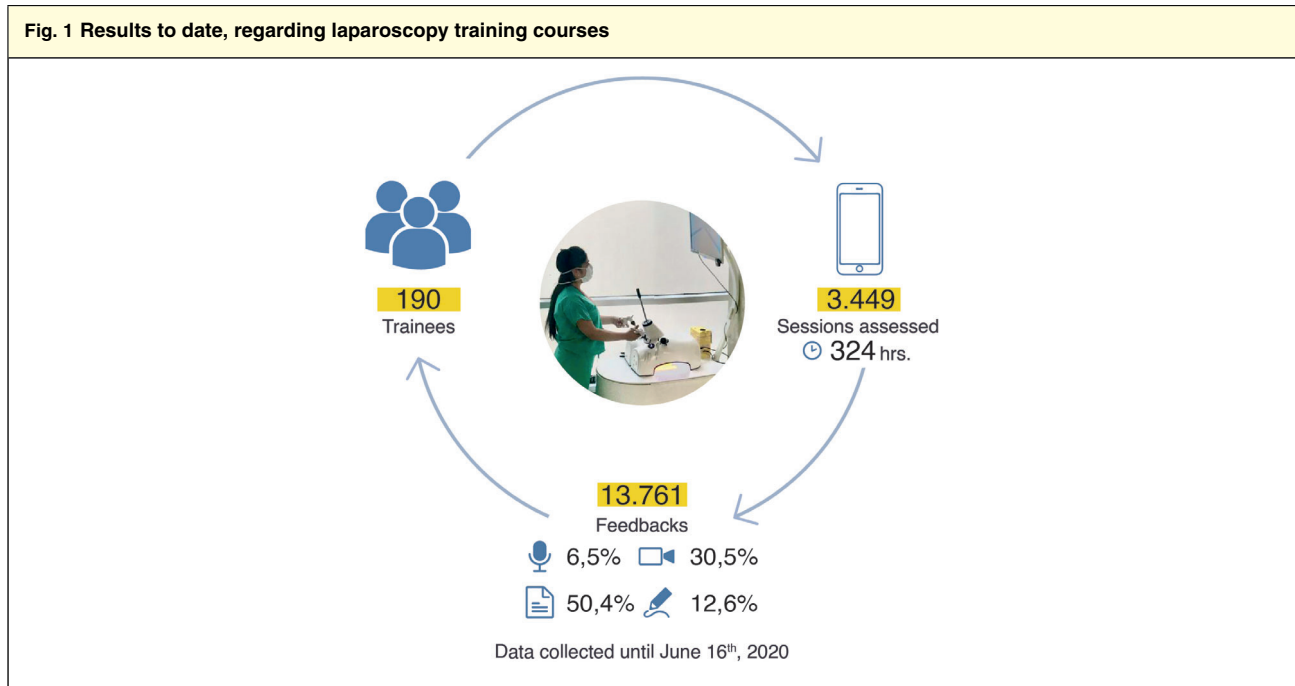
Web-based solutions are being increasingly helpful in supporting clinical and academic activities during the COVID-19 pandemic. Most educational platforms provide useful content to students but are unable to deliver cost-effective personalized feedback. We describe a validated technology-based methodology for remote skill training that has shown to be safe and efficient before and during the pandemic.

Since early 2019, our group developed LAPP, a web-mobile-based platform to train laparoscopic surgeons remotely. The platform connects trainees to an online network of certified tutors who teach procedural skills by delivering remote, deferred, and personalized feedback⁴. The methodology comprises four steps:

- Trainees watch instructional clips on their phones.

- They practice at their own pace and then upload a video of the exercise to the platform.
- Within 72 hours, an expert evaluates that recording giving feedback through text, audio, drawings, and videos, also assessing performance using validated rating scales and procedural time.
- Trainees receive personalized feedback on their phones/web to keep on training.

We developed LAPP to train surgeons from distant areas of our country and Latin America, unable to travel to our center where laparoscopy courses take place. LAPP demonstrated effective transfer of skills from a validated surgical instruction program⁵, showing no differences between trainees with on-site or remote training⁴. Before the COVID-19 crisis, our teacher network taught remotely 166 residents with over 3200 videos uploaded, comprising over 13000 feedbacks. COVID pandemic



arrived at our country in early March, and despite this, the LAPP system remains active with 24-new registered laparoscopy trainees, over 240 sessions assessed, and 711 feedbacks given since then (*Fig. 1*).


Our educational technology has shown to be effective for teaching laparoscopy and other procedures such as paracentesis, thoracentesis, and open surgery. Lately, COVID-19 related competencies have become of utmost importance, but in-person teaching has been difficult due to social distancing protocols. Using LAPP-methodology, COVID-related skills such as orotracheal intubation, personal protective equipment, mechanical ventilation, and prone-positioning are being taught remotely by experts to healthcare providers daily. For these competencies, in the last two months, instructors have delivered nearly 3700 feedback to 610 trainees in 796 assessed sessions. Our health ministry is now using the platform to provide further training to more than 1000 professionals during June while our experts from anesthesia, respiratory therapy, and nursery provide feedback safely from anywhere.

Pandemic times are boosting educational-technology solutions

to keep on learning. We describe a remote-teaching system that helps residents keep on training during lockdown times, supporting them with hundreds of expert feedbacks. The system not only removes the need for on-site trainers but also provides much convenience and safety to both instructors and trainees. The results are encouraging, and probably due to the easy scalability, methodologies like this will soon become part of our lives.

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