


COVID-19 and slowdown of residents' activity: Feedback from a novel e-learning event and overview of the literature

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Abstract

Objective: To evaluate the impact of an e-learning online event, created for supporting resident's training during the slowdown of surgical and clinical activities caused by COVID-19 pandemic. An overview of PubMed literature depicting the state of the art of urology residency in the COVID-19 era was performed as well, to contextualize the issue.

Methods: An online learning event for residents was set up at the beginning of the pandemic; the faculty consisted of experts in urology who provided on-line lectures and videos on surgical anatomy, procedures, updates in guidelines, technology, training. The audience was composed of 30–500 attendees from Italy, USA, India and Belgium. A questionnaire to analyze relevance, satisfaction and popularity of the lessons was mailed to 30 local residents.

Results and limitations: Almost all residents defined the web environment suitable to achieve the learning outcomes; the method, the number and the competence of the faculty were appropriate/excellent. Most of the younger residents (81.8%) stated their surgical knowledge would improve after the course; 72.7% declared they would take advantage into routine inpatients clinical activity. Nineteen more expert residents agreed that the course would improve their surgical knowledge and enhance their practical skills; almost all stated that the initiative would change their outpatients and inpatients practice. Overall, 44 articles available in PubMed have addressed the concern of urological learning and training during the pandemic from different standpoints; four of them considered residents' general perception towards web-based learning programs.

Conclusions: The paper confirms residents' satisfaction with e-learning methods and, to our knowledge, is the first one focusing on a specific event promptly settled up at the beginning of the outbreak. Web-based educational experience developed during the pandemic may represent the very basis for the implementation of prospective on-site training and overall scientific update of future urologists.

Keywords

COVID-19, pandemic, urology residency, training, e-learning

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Introduction

The outbreak of COVID-19 pandemic has led to a steep decrease in urological surgical and clinical activity between March and June 2020. The Italian Health System has undergone a sudden reorganization to face the global emergency¹: non-urgent elective surgery, including a large amount of oncologic procedures, and outpatient visits have been postponed in order to provide resources for

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UNIMORE RESIDENTS N' FRIENDS Coordinators: Prof. Bernardo Riccio, Prof. Salvatore Micali, Prof. Gianpaolo Bianchi Scientific committee: Dr. Sara Maria Chiara Sighinolfi, Dr. Stefano Puliti, Dr. Luca Sarrigi, Dr. Simone Assunna, Dr. Tommaso Catalgna	
1. LESSON 1: SCIENTIFIC METHODOLOGY - Date: 3rd April 2020, 4 p.m. (Italian time) - Topic: Basic teaching on how to write a paper review - Language: Italian - Audience: National - Maximum number of attendees: 30 - Relator: Prof. Bernardo Riccio	6. LESSON 6: NON-MUSCLE INVASIVE BLADDER CANCER - Date: 15th April 2020, 4 p.m. (Italian time) - Topics: guidelines on management of non-muscle invasive bladder cancer, TURBT vs TURBT on bloc - Language: Italian - Audience: National - Maximum number of attendees: 35 - Relator: Prof. Salvatore Micali
2. LESSON 2: ROBOTIC PARTIAL NEPHRECTOMY STEP BY STEP - Date: 6th April 2020, 4 p.m. (Italian time) - Topics: Surgical anatomy of the kidney, tips and tricks about partial nephrectomy - Language: English - Audience: International (from USA and Italy) - Maximum number of attendees: 40 - Relator: Prof. Bernardo Riccio - Special guest: Dr. Jibad Kanuk (from Cleveland Clinic)	7. LESSON 7: PCNL AND ENDOSCOPIC INSTRUMENTS - Date: 16th April 2020, 4 p.m. (Italian time) - Topics: Percutaneous nephrolithotomy in management of renal stone disease, description of endoscopic instruments - Language: Italian - Audience: National - Maximum number of attendees: 35 - Relator: Dr. Giorgio Buzzzi (IRCSS Policlinico San Donato, Busto Arsizio)
3. LESSON 3: FUNCTIONAL UROLOGY - Date: 10th April 2020, 4 p.m. (Italian time) - Topics: physiological bases of neurology, bladder dysfunction, role of urodynamic in clinical practice - Language: Italian - Audience: National - Maximum number of attendees: 40 - Relator: Dr. Michele Spinelli (from Ospedale Niguarda, Milano)	8. LESSON 8: ROBOTIC RADICAL PROSTATECTOMY STEP BY STEP - Date: 17th April 2020, 4 p.m. (Italian time) - Topics: Surgical anatomy of prostate and pelvic, tips and tricks in robotic prostatectomy, how to deal with complications in RARP, new technologies and perspectives in RARP - Language: English - Audience: International (from USA and Italy) - Maximum number of attendees: 100 - Relator: Prof. Bernardo Riccio - Special guest: Prof. Vipul R Patel (Global Robotics Institute Celebration FL, USA)
4. LESSON 4: DISASTERS IN SURGERY - Date: 13th April 2020, 4 p.m. (Italian time) - Topic: Disaster can happen any time during surgery: how to treat and how to prevent them - Language: English - Audience: International (from USA, India and Italy) - Maximum number of attendees: >100 - Relator: Prof. Bernardo Riccio, Prof. Rene Soete (University of Southern California), Prof. Mitr Deek (University of Southern California), Prof. P. P. Raju (Jawahar Institute Post Graduate Center)	9. LESSON 9: NEW TECHNOLOGIES IN MEDICINE - Date: 20th April 2020, 4 p.m. (Italian time) - Topics: historical background, evolution of endourology and robotic surgery, new technologies and perspectives in surgery - Language: Italian - Audience: National - Maximum number of attendees: 35 - Relator: Prof. Gianpaolo Bianchi
5. LESSON 5: PROSTATE CANCER - Date: 14th April 2020, 4 p.m. (Italian time) - Topics: guidelines on management of prostate cancer, role of prostate biopsy - Language: Italian - Audience: National - Maximum number of attendees: 35 - Relator: Prof. Gianpaolo Bianchi	10. LESSON 10: ANDROLOGY - Date: 21st April 2020, 4 p.m. (Italian time) - Topics: Basics of andrology, management of erectile dysfunction - Language: Italian - Audience: National - Maximum number of attendees: 35 - Relator: Dr. Antonio Barbieri (Azienda OU Parma)
	11. LESSON 11: TRAINING IN UROLOGY AND ROBOTIC SURGERY - Date: 23rd April 2020, 4 p.m. (Italian time) - Topics: role of standardized robotic training in surgical proficiency - Language: English - Audience: International (from Belgium and Italy) - Maximum number of attendees: 50 - Relator: Prof. Alex Mullier (President of OREI ACADEMY - Surgical Training A&B, Belgium)
	12. LESSON 12: TESTICULAR CANCER - Date: 24th April 2020, 4 p.m. (Italian time) - Topics: multidisciplinary strategies in management of testicular cancer - Language: Italian - Audience: National - Maximum number of attendees: 35 - Relator: Dr. Nicola Nocchi (Istituto Nazionale del Tumore, Milano)
	13. LESSON 13: LAPAROSCOPIC TREATMENT OF RENAL MASSES - Date: 27th April 2020, 4 p.m. (Italian time) - Topics: surgical anatomy of the kidney, role of laparoscopy in partial nephrectomies, laparoscopic vs robotic surgery - Language: Italian - Audience: National - Maximum number of attendees: 35 - Relator: Dr. Sara Virginia Varca (ASST Rhodense, Garbagnate Milanese)
	14. LESSON 14: THALIEP - Date: 28th April 2020, 4 p.m. (Italian time) - Topics: guidelines on benign prostatic hyperplasia, role of Thulium in surgical management of BPH - Language: Italian - Audience: National - Maximum number of attendees: 35 - Relator: Dr. Giorgio Buzzzi (IRCSS Policlinico San Donato, Busto Arsizio)
	15. LESSON 15: LAPAROSCOPIC ENDOGAME - Date: 29th April 2020, 4 p.m. (Italian time) - Topics: historical background of laparoscopic surgery, new technologies and perspectives in laparoscopy - Language: English - Audience: International (from USA and Italy) - Maximum number of attendees: 70 - Relator: Dr. Louis Kavvouni (The Smith Institute of Urology, New York)
	16. LESSON 16: SURGICAL MANAGEMENT OF LOWER URINARY TRACT SYMPTOMS - Date: 30th April 2020, 4 p.m. (Italian time) - Topics: guidelines on lower urinary tract symptoms, role of Halmium in surgical management of BPH - Language: Italian - Audience: National - Maximum number of attendees: 35 - Relator: Dr. Michele Polunzoni (Azienda OU Firenze)
	17. LESSON 17: VASCULAR INTRA-OPERATIVE COMPLICATIONS IN ROBOTIC SURGERY - Date: 11th May 2020, 4 p.m. (Italian time) - Topics: importance of anatomical exposure in surgery, management of vascular intraoperative complications in robotic surgery - Language: Italian - Audience: National - Maximum number of attendees: 30 - Relator: Dr. Filippo Turri
	18. LESSON 18: PENILE CANCER - Date: 12th May 2020, 4 p.m. (Italian time) - Topics: guidelines on penile cancer, surgical and clinical management of penile cancer - Language: Italian - Audience: National - Maximum number of attendees: 30 - Relator: Dr. Antonio Barbieri (Azienda OU Parma)

Figure 1. UNIMORE residents' n' friends panel, topics, and number of attendees.

COVID-19 patients and non-deferrable cases.² The common perception is that this collapse in urological activity has deeply impaired the resident's training programs. The slowdown involved young residents (whose activity is usually focused on inpatients, outpatients, minor surgery and postoperative benign pathologies), as well as the senior ones, whose surgical training and/or fellowship has been stopped according to the general recommendation to decrease as much as possible the operative time and the likelihood of adverse events. Thus, training programs suddenly declined together with frontal lectures, due to social distancing measures required to prevent the infectious spread.³

However, the pandemic improved chances for web-connections, involving perspectives on learning: pre-recorded videos, webinar, journal club via social media, podcasts, virtual clinical rounds—are amongst the novel opportunities we became accustomed to.

By the beginning of April 2020, we promoted at our academic Institution a learning webinar event, at first designed for local residents, but later extended also to external audience. Thereafter, we aimed to analyze the relevance, the satisfaction and the popularity of the webinar format among local attendees.

Additionally, to contextualize the issue and underline its relevance, we performed a narrative review on urology residents' activity and well-being during the pandemic.

Methods

The e-learning event was fully provided by the University of Modena and Reggio Emilia (UNIMORE), thus being

called “UNIMORE residents' n' friends.” It accounted for 18 separate webinars, each one promoted through social networks, which were all held on Zoom platform between 3rd of April and 12th of May 2020. Both national and international well-known professional figures agreed to join the event and to present to the audience common urological topics they are expert on. In detail, the event covered lectures on surgical anatomy, on step by step surgical techniques and tools supported by videos, on updates in guidelines, on new technologies and perspectives in surgery, on training and resident's learning curve (Figure 1 summarizes the complete panel and topics of the event). The event was initially planned for residents at the local institution; however, it gradually and spontaneously gathered other figures such as medical students and urologists from other institutions and countries, including USA, India and Belgium. For all the participants free access was guaranteed. The number of attendees ranged from 30 to 500 in total for each lecture, finally accounting for a mean of 68 attendees, approximately twice the number of urology residents affiliated to our institution. None of the residents was directly involved in discussing presentations or giving a lecture, but all the lessons were interactive with live debates among trainers and trainees.

To quantify the relevance of the event and the individual satisfaction, at the end of the course a cumulative online survey was developed and sent to residents through a Google platform. Data about age, year of residency, number of scientific papers published, amount of surgical procedures performed as endoscopic/laparoscopic/robotic first surgeon, number of webinars attended were collected. Multiple-choice questions, partially adapted from

the “Participant feedback questionnaire: online course” by Royal College of Surgeons,⁴ evaluating through a 5-point Likert scale the feeling and attitude the residents had toward the webinar-learning were asked to the attendees. The survey, designed according to the checklist for reporting results of internet e-Surveys (cHerrieS),⁵ was mailed to all 30 attendees from UNIMORE Residency Program (Supplemental Material 1). Every one of them had attended more than 50% of the lessons. Reply to questionnaire was given anonymously; all data were transferred to an Excel sheet and a descriptive statistical analysis was performed.

All participants from the local Institution completed the survey; 11 were called “novices,” since they had less than 1 year of urological practice and could be still considered naïve toward it; the remaining ones were residents with more than 1 year of experience in Urology.

Additionally, on December 2020, a PubMed search of the literature was performed by using the terms “residents” and “urology” and “COVID,” to get insights on the state of the art and future perspectives about the issue. Articles not strictly dealing with urology residency were excluded.

The search was performed by a senior author and a young one (MCS and TC).

Results

Among the novices, none of them had performed more than 10 surgical procedures as first surgeon nor had published more than five scientific papers. Almost all agreed that the course was held in a suitable environment to achieve the learning outcomes, and that the delivery method, the number and the competence of the faculty were appropriate; most of them (9/11, 81.8%) stated that their surgical knowledge would improve after the course, even if only five (45.4%) declared they would find immediate benefit in terms of practical skills. The majority (8/11, 72.7%) declared they would take advantage in the inpatient clinical practice they are currently involved on.

Nineteen attendees were residents with more than 1 year of experience: most of them had performed from 10 to 50 endoscopic, open or laparoscopic and/or robotic procedures, even as first surgeon; some had published >10 papers. They all agreed that the outcomes had been clearly defined and that the structure of the course was appropriate. All agreed the course could improve their surgical knowledge and enhance their practical skills; almost all stated that the initiative would change their outpatients and inpatients practice.

From the PubMed search, a total of 60 articles were found. Sixteen articles were excluded because not strictly connected to urology residents’ activity. Forty-four articles finally matched the search. Twenty-one were comments/editorials/reviews broadly describing changes in residency programs during the pandemic, mostly published during the very initial phase of the outbreak^{6–26}; some of them focused

also on perspectives toward digital education and e-learning opportunities.^{7–11,20,24} Four articles highlighted the viewpoint of medical students and urology applicants,^{27–30} impaired by the reduced opportunity for rotations.²⁹

Fourteen articles consisted of surveys addressing residents’ perception toward their learning during the pandemic, the redistribution of activity (including details on involvement on the care of COVID patients), opportunities for away rotations in surgical fields, subjective feelings, and burnout syndromes during the pandemic.^{22,31–43}

Four papers addressed the general viewpoint of urology residents on web-based education, assessed by means of surveys. Opinions on the usefulness of videos, web-based clinical case discussions/frontal lessons/journal clubs and web faculty interviews were explored.^{44–48} Claps et al—surveying 356 urology residents—focused on different kinds of smart learning modalities, with 77.8% of urology residents considering as highly useful videos on-demand, 69.8% webinars, 65.8% podcasts, and 34.2% SoMe.⁴⁵ Campi et al highlighted that updates on guidelines and surgical videos are considered as highly useful by the greatest proportion of residents, with seminars on leadership and on non-technical skills highly interesting as well.⁴⁶ Overall, pre-recorded surgical videos, interactive webinars on clinical cases, and pre-recorded videos on guidelines were the preferred combinations of smart learning modalities. A single article⁴⁸ addressed residents’ satisfaction toward a specific structured e-learning program, developed before the pandemic scenario.

Discussion

Smart technology with online events has become an essential part of urological updates.

While the pandemic had changed and slowed our daily life, innovations in surgical techniques for urological oncology—dealing with kidney, prostate and bladder cancer, surgical and basic research—and in technological platforms are still going on, possibly lacking a proper international diffusion and coverage due to travel restrictions. Smart technology is seemingly able to fill the gap between the knowledge of innovations and the potential unawareness due to this dramatic scenario.

Even if some limitations have arisen for scientific meetings⁴⁹—namely the lower emotional involvement and networking compared to conventional ones, together with the possible crisis of scientific societies—online events are perfectly fitting the academic learning. In our experience, webinars confirmed to provide interactive lessons and sharing opportunities; the gradual planning of the event allowed us to cover some topics—as surgical anatomy—often neglected during conventional residency programs. To note, senior residents seem to be the ones mostly benefiting from detailed surgical lectures and videos.

Several papers addressed the concern of urological learning and training during the pandemic from different

standpoints. The one from Sen et al.⁴⁸ is the most similar to the current, since reporting residents' satisfaction with a structured web-based educational method. Nevertheless, it has been developed before the outbreak, and its usefulness could be seemingly higher in the pandemic scenario, consistent with our outcomes.

To our knowledge, this is the very first study evaluating a spontaneous e-learning event, completely developed during the emergency, that involved international trainers; the satisfaction of resident attendees may represent a slice of real life about the contemporary academic learning and could be useful to implement programs of urological schools and surgical curricula also in a non-pandemic scenario.

The present study is not devoid of limitations. First, the study lacks a prior survey collecting expectations toward web-lessons and lacks strict adherence to guidelines for surveys too; however, the absence of a pre-planning of the overall activity (either web-event and survey) is partly justified by the unprecedented and outbreaking setting. Despite lectures were held on Zoom platform and promoted through social networks, the questionnaire was mailed only to UNIMORE urology residents because we could not track the email addresses of most external attendees.

Conclusions

In a period characterized by a decreased practical hands-on training, web-educational methods may support the learning curve in both clinical and surgical activities. Urology residents' satisfaction, as assessed from surveys, is a noteworthy outcome, suggesting that on-line education may fill the gap left by the pandemic.

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Supplemental material

Supplemental material for this article is available online.

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