EDUCATION

How the COVID-19 pandemic changed urology residency – a nationwide survey from the Portuguese resident's perspective

Bernardo Lobão Teixeira, João Cabral, Gonçalo Mendes, Mariana Madanelo, Maria Alexandra Rocha, Sofia Mesquita, Jorge Correia, Catarina Tavares, André Marques-Pinto, Avelino Fraga

Centro Hospitalar Universitário do Porto, Department of Urology, Porto, Portugal

Citation: Teixeira BL, Cabral J, Mendes G, et al. How the COVID-19 pandemic changed Urology residency – a nationwide survey from the Portuguese resident's perspective 2021; 74: 121-127.

Article history
Submitted: Sept. 29, 2020
Accepted: Dec. 16, 2020
Published online: Jan. 9, 2021

Corresponding author
Bernardo Lobão Teixeira
Centro Hospitalar Universitário do Porto
Department of Urology
001 Porto, Portugal
Largo do Prof. Abel Salazar Street
4099-001 Porto
phone: +321 917 471 620
Bernardolat@gmail.com

Introduction The aim of this article was to evaluate the impact of the COVID-19 pandemic on urology residency.

Material and methods A 30 question online survey was sent to all urology residents in Portugal between the 25th of April and the 25th of May 2020. Reduction in different areas of clinical activity during the COVID-19 period were evaluated and their perceived impact on their residency program was quantified.

Results Forty-three (54.4%) Portuguese urology residents responded to our inquiry. Eighty-one percent report having supressed their activity by more than 75% in the outpatient clinic; 48.8% in diagnostic procedures; 29.3% in endoscopic surgery; 67.5% in laparoscopic/robotic surgery and 17.5% in major open surgery. There were no differences in clinical activity reduction across residency years. Considering the impact of COVID-19 on urology training programs, 32.6% plan on prolonging residency. During the COVID-19 period, a larger number of residents report having spent more time developing research projects or on continuing medical education, as compared with the pre-COVID-19 period (p = 0.012).

Conclusions COVID-19 had a major impact on Urology residency in Portugal, with major short- and long-term consequences. A large proportion of residents are considering prolonging their residency as a result.

Key Words: SARS-CoV-2 ‹› residency ‹› survey ‹› training programs ‹› urology ‹› minimally invasive surgery

INTRODUCTION

On December 31st 2019, Chinese doctors from the city of Wuhan in the province of Hubei reported the occurrence of pneumonia cases of unknown aetiology. Subsequently, a novel coronavirus was identified and deemed responsible for COVID-19, a disease that reached pandemic proportions on March 11th 2020 [1]. On May 25th, the World Health Organization reported that there were more than 5 million cases of COVID-19 and an estimated 340 thousand deaths worldwide [2]. During the same period, 30,000 cases and 1330 deaths were reported in Portugal [3]. Portugal was praised for its management of the pandemic's first wave, owing to early lockdown and widespread testing compared to other European countries [4]. This achievement, though, occurred at the expense of major health care changes. Elective surgeries and outpatient consultation were deprioritized in numerous medical specialities. Residency programs and related hospital internships and curricular activities were put on hold. Residents themselves were placed in rotating teams, some of which were redirected to medical wards to treat COVID-19 patients.

The main purpose of this study is to characterize the impact of COVID-19 on the clinical activity of Portuguese urology residents and then discuss the consequences of this impact.

doi: 10.5173/ceju.2021.0278.R1

MATERIAL AND METHODS

An online survey with 30 questions was sent by e-mail and social media to Portuguese urology residents and was kept available from April 25th to May 25th 2020. Demographic data were collected including sex, age, year and hospital of residency. The total number of residents was estimated based on residency positions from the last 7 years, according to the official site of the Portuguese Ministry of Health. Residents from the 2014–2019 program had their consultant exam postponed due to the COVID-19 pandemic and, as such, were invited to participate. Answers were grouped with the 2015–2020 residents.

Residents were asked to estimate how much their participation in different activities was reduced, namely in the outpatient clinic, endourologic surgery, major open surgery, laparoscopic/robotic surgery and diagnostic procedures such as prostate biopsies. Scores were based on four categories: reduction of 0–25%, 25–50%, 50–75% and 75–100%. Time dedicated to continuous medical education during and before the pandemic was also inquired, as well as measures to reduce the risk of contamination during minimally invasive surgery. Other questions concerned changes in the emergency department, the urology ward, multidisciplinary oncologic meetings and the use of telemedicine. Final questions concerned the resident's perceived impact of the pandemic on their medical/surgical training and on patient outcomes.

Data was analysed using IBM SPSS Statistics v.26® through descriptive and analytical statistics. Fisher's exact test was used to compare the year of residency with the reduction in clinical activity. We hypothesized that residents in the first years of training would have a higher reduction in their clinical activity. A p-value less than 0.05 was considered statistically significant.

RESULTS

From a total of 79 interns, 43 (54.4%) responded to the survey. Seventy-two percent of responders were male and mean age was 28.5 years. The proportion of residents from the first, second, third, fourth, fifth and sixth year was 11.6%, 18.6%, 14%, 14% and 23.3%, respectively. Figure 1 summarizes the main findings concerning clinical activity reduction during the pandemic. No significant statistical difference was seen between residency year and clinical activity reduction in its various categories (outpatient clinic, diagnostic procedures, laparoscopic/robotic surgery, endoscopic surgery, major classic surgery).

During the pre-pandemic period, 14 (32.6%) spent less than 2 hours per week on continuous medical education activities, 13 (30.2%) between 2 to 4 hours, 6 (14%) between 4 to 6 and 10 (23%) spent 6 or more hours. However, during the pandemic 4 (9.3%) spent less than 2 hours per week, 12 (27.9%) between 2 to 4 hours, 4 (9.3%) between 4 to 6 and 23 (53.5%) spent 6 or more hours on continuous medical education or research. This difference reached statistical significance, with $p = 0.012$

Forty-one residents (95.3%) reported that their department adopted telemedicine as an alternative way to follow their patients in the outpatient clinic, while 2 (4.7%) report having supressed the outpatient clinic altogether. Residents were asked to what extent they agreed with the sentence "Telemedicine contributed to better patient care during the pandemic". Five residents (15.6%) completely agreed with the statement, 13 (40.6%) mostly agreed, 10 (31.3%) slightly agreed, 2 (6.3%) slightly disagreed, 1 (3.1%) mostly disagreed and 1 (3.1%) disagreed completely. As for the statement "Telemedicine after the pandemic will be of added value", 7 (16.3%) of interns strongly agreed, 11 (25.6%) agreed 18 (41.9%) were undecided, 3 (7%) disagreed and 4 (9.3%) disagreed completely.

The survey also addressed how laparoscopic and robotic surgery was affected, owing to the risk of COVID-19 contamination. Most residents (53.5%) reported that alternative surgical approaches were used, 34.9% reported having postponed laparoscopic/robotic surgery, 25.6% referred no change in surgical approach and 4.7% reported using non-surgical alternatives no minimally invasive surgery (Figure 2). Figure 3 summarizes the measures taken to decrease the risk of SARS-CoV-2 contamination during minimally invasive surgery. Most residents (72.1%) believed minimally invasive surgery posed no risk during the pandemic.

As for the time dedicated to activities in the urologic emergency department, 73.2% of residents referred no change, 9.8% an increase and 17.1% a decrease in the number of hours. Five (11.6%) residents were directly involved in the treatment of COVID-19 patients, although of these, 84.6% did not receive any kind of specific training.

In regard to multidisciplinary uro-oncology meetings, 81.6% of residents reported that they were held through videoconference, 8% reported complete suppression of this kind of medical meeting, and 10.5% referred resorting to other alternatives.

Considering the reorganization of the ward during the pandemic, 33.3% of residents reported that beds in the urology ward were occupied by other

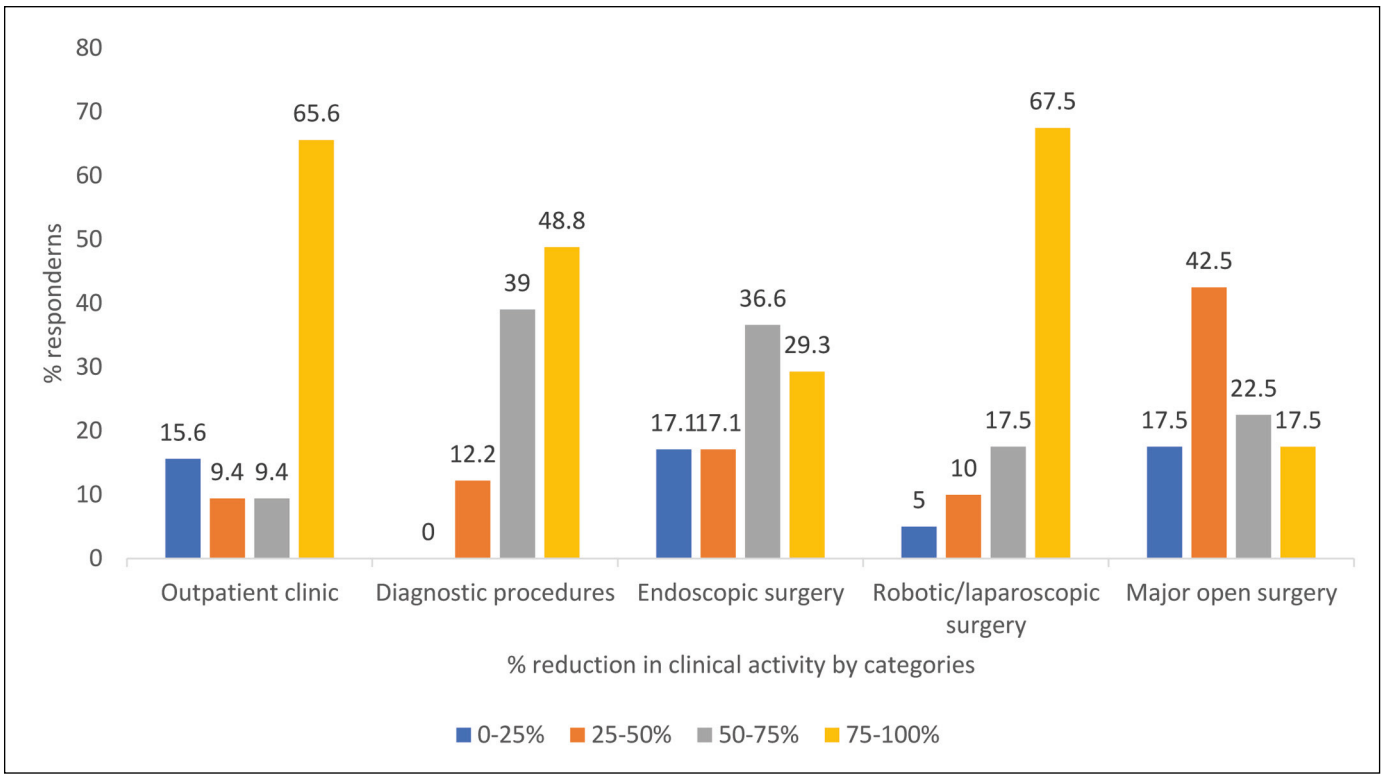

Figure 1. *Reduction of clinical activity during the COVID-19 pandemic.*

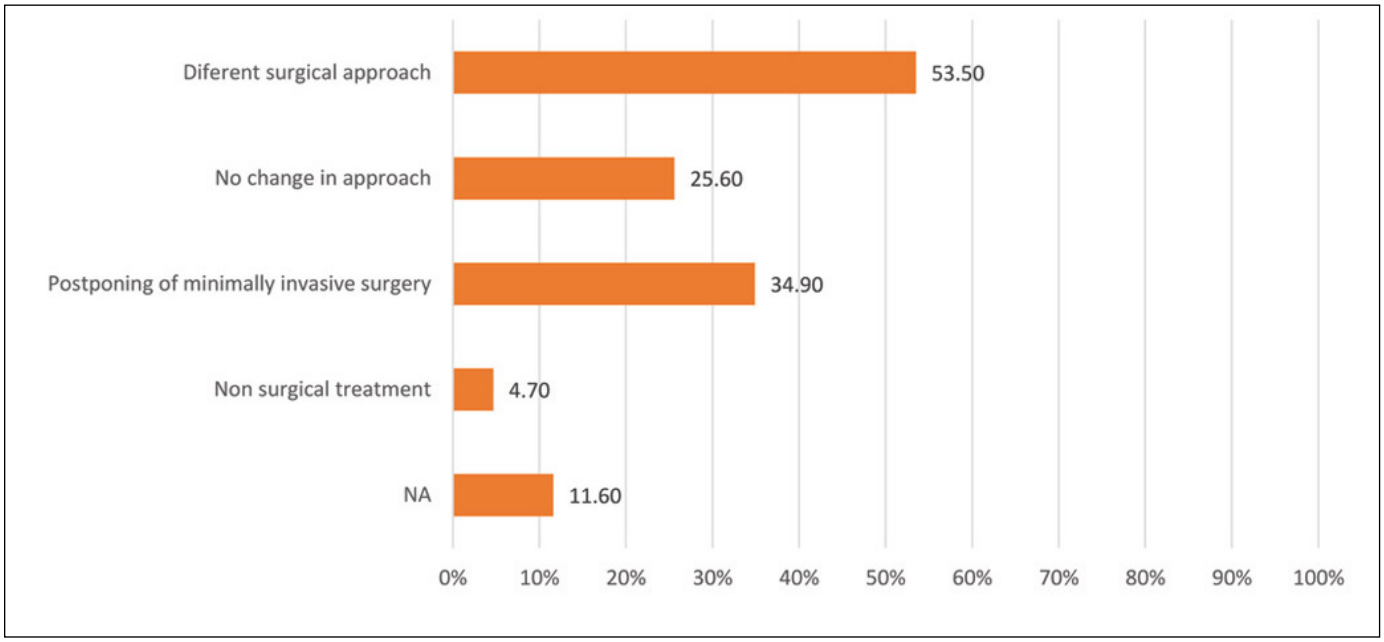

Figure 2. *"Considering the possibility of SARS-CoV-2 contamination during minimally invasive surgery, how was this type of approach affected in your center?".*

NA – not applicable

specialities, 35.7% reported no change in ward organization, and 26.2% refer the allocation of beds to COVID-19 patients. 4.8% responded that other alternatives were taken in terms of ward reorganization. No urology department was converted to an intensive care unit.

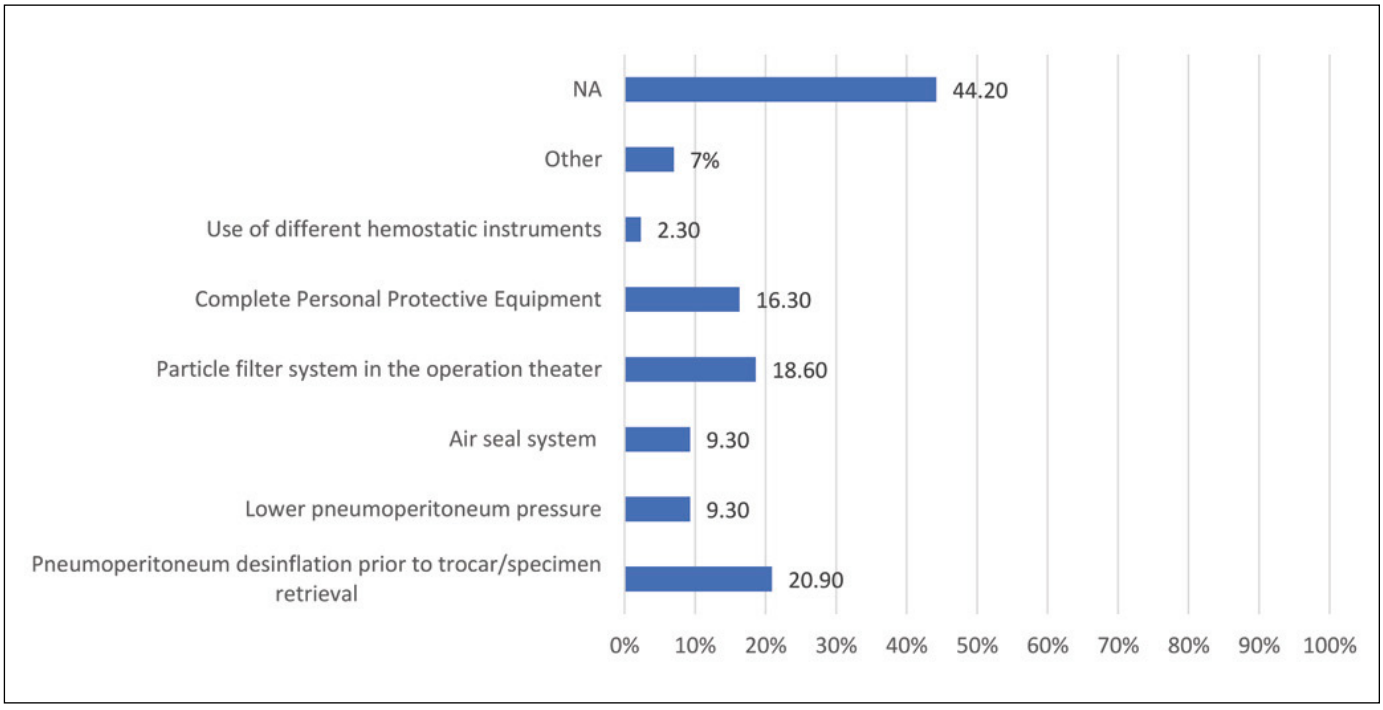

Figure 3. *Measures adopted to lower the risk of contamination with SARS – CoV-2 during minimally invasive surgery.*
NA – not applicable

Residents were asked to grade the impact of the pandemic on their training on a scale from 0 ('no effect on training') to 5 ('training extremely affected'). Most residents (72.1%) considered that their training was very or extremely affected due to the COVID-19 pandemic. As such, 14 (32.6%) of residents admitted wanting to prolong their residency program, 14 (32.6%) answered that they might do so, and 15 (34.9%) did not feel that they needed to prolong their training.

Most residents (53.5%) believed that the reduction of clinical activity in urology during the pandemic would adversely affect the oncological and functional outcomes of most patients, 18 (41.9%) thought that it would only affect some patients, and 2 (4.7%) saw this impact as non-existent. When asked to grade this impact, 1 (2.4%), 10 (24.4%), 25 (61%) and 5 (12.2%) thought the pandemic would have a low, moderate, severe and very severe impact on patient outcomes, respectively.

DISCUSSION

To the best of our knowledge, this is the first work addressing the impact of the COVID-19 pandemic on Portuguese urology residents. We had a representative sample of urology residents across different years of training. As explained, some residents from the last year had their consultant exam postponed as a consequence of the pandemic, which explains the slightly higher number of responses from 6th year interns.

All Portuguese urology residents are trained in public hospitals, which received directives to limit the number of non-urgent hospital visits. Consequently, outpatient consultations and diagnostic procedures were greatly reduced, as portrayed by our results, where 65.6% and 48.8% of residents referred suppression of more than 75% of these activities, when compared to pre-pandemic periods.

In recent years, telehealth has gained interest, benefitting both patients and health care providers. However, a variety of institutional and policy obstacles continued to delay the implementation of telehealth services [5, 6]. The current pandemic has overcome some these obstacles; medical consultations, conducted mainly by telephone, alleviated the burden of fewer hospital visits by patients. The pandemic has driven research publication in this area, and a recent meta-analysis concluded that telehealth can be implemented successfully in urology [7]. A sizeable proportion of Portuguese residents agree with this premise, despite being more sceptical about telehealth's advantages after the pandemic. Interestingly, similar results were seen in a Polish survey, were telemedicine was amply used during the pandemic, despite uncertainty about its application after this period [8]. Reasons presented by the authors for the

aversion of telemedicine include its rapid and unprepared introduction and low selection of patients. We add that the development of local and international guidelines for the follow-up of urological patients with the use of telehealth might mitigate this aversity. Unfortunately, diagnostic procedures were also severely affected, raising concerns, as most of these procedures are part of the diagnosis or follow-up of oncological patients, and cannot be replaced by telehealth.

We also observed a substantial reduction in the number of surgical procedures. Laparoscopic/robotic surgery had a greater reduction when compared to endoscopic and major open surgery (reduction by more than half of surgical volume in 85% vs. 65.9% vs. 40%, respectively). This might be because a significant amount of endoscopic surgeries, mainly for urolithiasis, are done in an ambulatory setting, permitting shorter hospital stays and thus reducing the risk of in-hospital COVID-19 infection. Major open surgery may have been relatively spared compared to laparoscopic/robotic surgery because of patient selection, as more advanced tumours and technically more challenging cases were prioritized over regular procedures, in line with recommendations by local and international urologic scientific societies [9].

The activity in the emergency department remained unsurprisingly immune to restructuring during this period (73.2% reporting no change in the number of dedicated hours), underlying its essential role. Twelve percent of residents were involved in the treatment of COVID-19 patients. In contrast, results from Hospital Universitario Ramón y Cajal in Madrid show that 50% of urology residents were recruited to COVID-19 specific units [10], while in Italy, the same happened to 8% [11]. A national inquiry in the United States placed this number at 26% [12]. In Paris, interns were allocated to triage in the emergency department, intensive care units or to patient transfer between institutions [13]. From the Portuguese residents allocated to COVID-19 patient treatment areas, only 15.4% report having received specific training, while in Italy, more severely affected by the pandemic, 63% did so [11]. A global survey has presented similar figures, where 32% of urologist received training in personal protective equipment and only 14% felt comfortable with their training in infectious diseases [14]. Having people unprepared to deal with respiratory diseases might comprehensively be harmful to patients, and this lack of training has also been related to professional stress and burnout [15].

Urology residency in Portugal consists of a 6-year training period, preceded by a general year common to all medical specialties. Similar to other countries, residency programs include clinical rotations in specific areas or sub-specialities (some mandatory, others optional), such as general surgery, pediatric urology, nephrology, etc. Limited exposure to some of this subspecialities due to shorter or non-existent rotations might preclude contact with specific diseases and clinical scenarios, compromising training [16]. The significant reduction in surgical volume can also compromise training, and residents might not meet minimum requirements because of the pandemic. In fact, 45% of responders consider their training extremely affected. Concerns have also been raised by 60% of residency program directors across the United States [12]. In the opinion of the authors, this is particularly worrisome, and ultimately has led one third of Portuguese residents wanting to prolong their training.

In a letter to the editor titled, "The Good, the Bad, and the Ugly of the COVID-19 Pandemic in a Urology Residency Program in Singapore" Yi Quan Tan et al. [17] describe, 'the Bad' as the impact of reduced surgical activity in residency and 'the Ugly' as the inherent risk of contamination associated with treating patients; 'The Good', however, represents the opportunity to revisit fundamentals on disease pathophysiology. We would add that another silver lining would be the opportunity to focus on future research protocols. The observed increase in the number of hours dedicated to research and continuous medical education was clear in our survey, meaning that reduced clinical activity does not equal inertia for urology residents. Similar results were seen by other authors [18]. In the United States, most residents invested more time in self-directed learning (90%), and more time in research (70%) [16]. Several institutions have implemented or improved online continuous medical education platforms, such as online lectures or national virtual video-based curriculum [14, 19, 20]. This kind of platforms are welcome and greatly appreciated during the pandemic and their advantages are certain to last well after the end of the global health crisis. However, they do not replace bedside medicine and clinical practice [21].

The risk of viral particle aerosolization lead some societies to recommend against the use of laparoscopy. According to the interns that responded to our survey, recommendations were followed, with the majority (53.5%) reporting having used different surgical approaches. The Robotic Surgery Section of the European Association of Urology released guidelines in order to diminish contamination risks during minimally invasive surgery [22], followed in part by the Portuguese urology community (Figure 3). Surprisingly, 72.1% of interns considered the

use of minimally invasive surgery safe, in lieu with the existent evidence [23].

There are potential limitations to our survey. Our questionnaire was not validated, and represents national results, limiting widespread comparison with other countries. The survey was entirely in Portuguese, and some answers might not convey the same information when translated to English. Also, total number of residents in Portugal is small when compared to other countries, and response rate was not high, limiting some statistical analysis. Answers were collected during longer periods than similar surveys. However, they were gathered shortly after intense lockdown measures, and this might have led residents to overestimate the negative impact of the pandemic on their future training. In fact, after the first wave of infection, surgical volume returned to normal, and even increased in some hospitals, allowing residents to catch up. Nevertheless, by the time of submission of this paper, Portugal and the rest of Europe are entering its second wave of infection, that might prove harder than the first. As such, current findings remain up-to-date, and when compared to similar surveys, reveal how residents across different countries, distinctly affected by the pandemic and with their own management plans, feel equally frustrated and concerned about their training.

CONCLUSIONS

The results of this survey demonstrate the severe impact of the pandemic on elective urological clinical activity, with perceivable consequences to an intern's surgical training, regardless of the residency year. Short and long-term measures should be taken to lower the impact on residency programs throughout the urology world. Future research, with a longer follow-up time will be needed to accurately measure the impact of this pandemic on urology training.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

References

1. https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020 (accessed on the 5th of June 2020).
2. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200525-covid-19-sitrep-126.pdf?sfvrsn=887dbd66_2 (accessed on the 5th of June 2020).
3. https://covid19.min-saude.pt/wp-content/uploads/2020/05/84_DGS_boletim_202005251.pdf (accessed on the 5th of June 2020).
4. https://www.ft.com/content/67e1661b-f12b-4473-9bc2-aa2b5998ad73 (accessed on the 25th October 2020).
5. Modi PK, Portney D, Hollenbeck BK, Ellimoottil C. Engaging telehealth to drive value- based urology. Curr Opin Urol. 2018; 28: 342-347.
6. Gadzinski AJ, Ellimoottil C. Telehealth in urology after the COVID-19 pandemic. Nat Rev Urol. 2020; 17: 363-364.
7. Novara G, Checcucci E, Crestani A, et al. Telehealth in Urology: A Systematic Review of the Literature. How Much Can Telemedicine Be Useful During and After the COVID-19 Pandemic? Eur Urol. 2020; 78: 786-811.
8. Rajwa P, Przydacz M, Zapała P, et al. How has the COVID-19 pandemic impacted Polish urologists? Results from a national survey. Cent European J Urol. 2020; 15; 73: 252.
9. Amparore D, Campi R, Checcucci E, et al. Forecasting the Future of Urology Practice: A Comprehensive Review of the Recommendations by International and European Associations on Priority Procedures During the COVID-19 Pandemic. Eur Urol Focus. 2020; 6: 1032-1048.
10. Hevia V, Lorca J, Hevia M, D, et al. Pandemia COVID-19: impacto y reacción rápida de la Urología. Actas Urol Esp. 2020; 44: 450-457
11. Amparore D, Claps F, Cacciamani GE, et al. Impact of the COVID-19 pandemic on urology residency training in Italy. Minerva Urol Nefrol. 2020; 72: 505-509.
12. Rosen GH, Murray KS, Greene KL, Pruthi RS, Richstone L, Mirza M. Effect of COVID-19 on Urology Residency Training: A Nationwide Survey of Program Directors by the Society of Academic Urologists. J Urol. 2020; 204: 1039-1045.
13. Pang KH, Carrion DM, Rivas JG, et al. The Impact of COVID-19 on European Health Care and Urology Trainees. Eur Urol. 2020; 9-11.
14. Teoh JY, Lay W, Ong K, et al. A Global Survey on the Impact of COVID-19 on Urological Services. Eur Urol. 2020; 78: 265-275.
15. Abdessater M, Rouprêt M, Misrai V, et al. COVID19 pandemic impacts on anxiety of French urologist in training: Outcomes from a national survey. Prog Urol. 2020; 30: 448-445.
16. Fero KE, Weinberger JM, Lerman S, Bergman J. Perceived Impact of Urologic Surgery Training Program Modifications due to COVID-19 in the United States. Urology. 2020 1; 143: 62-67.
17. Tan YQ, Wang Z, Tiong HY, Chiong E. The Good, the Bad, and the Ugly of the COVID-19 Pandemic in a Urology Residency Program in Singapore. Urology. 2020; 142: 244-245.
18. Gravas S, Ahmad M, Hernández.Porras A, et al. Impact of COVID-19 on medical education: introducing homo digitalis. World J Urol. 2020; 29; 1-7.
19. Tabakin AL, Patel H V, Singer EA. Lessons Learned from the COVID-19 Pandemic: A Call for a National Video- Based Curriculum for Urology Residents. J Surg Educ. 2021; 78: 324-326.

20. Porpiglia F, Checcucci E, Amparore D, et al. Slowdown of urology residents' learning curve during the COVID-19 emergency. BJU Int. 2020; 125: E15-E17.

21. Tobia I. Impact of COVID-19 Pandemic on Ibero.American Urology Residents: Perspective of American Confederation of Urology (CAU). Int J Braz Urol. 2020; 46 (Suppl 1): 165-169.

22. Mottrie A. ERUS (EAU Robotic Urology Section) guidelines during COVID-19 emergency. 25 March 2020. https://uroweb.org/eau-robotic-urology-section-erus-guidelines-during-covid-19-emergency/

23. Morris SN, Fader AN, Milad MP, Dionisi HJ. Understanding the 'Scope' of the Problem: Why Laparoscopy Is Considered Safe during the COVID-19 Pandemic. J Minim Invasive Gynecol. 2020; 27: 789-791. ■