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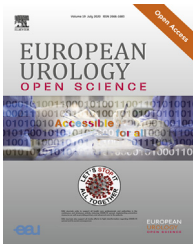

European Association of Urology

Education

Impact of COVID-19 on Clinical and Academic Urological Practice: A Survey from European Association of Urology Section of Uro-technology

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Abstract

Background: The unexpected coronavirus disease 2019 (COVID-19) pandemic has spread worldwide rapidly, developing into a global health crisis. At the same time, it has seriously impacted the daily activities in all the fields of urology.
Objective: To better understand the impact of the COVID-19 pandemic on clinical, academic, and scientific activities as well as on the quality of life of urologists from the main centers in Europe.
Design, setting, and participants: We conducted a survey using a 37-item questionnaire. The survey included three main sections: clinical practice, academic/scientific activities, and personal/social quality of life.
Outcome measurements and statistical analysis: A descriptive analysis was performed using the collected data.
Results and limitations: A total of 107 representatives affiliated to different centers from 22 countries completed the survey. Clinical activities were affected in 54.2% of the centers, and 85.0% of the elective surgeries were cancelled. Of the urological departments, 64.5% were still performing minimally invasive surgery for malignant disease. In 33.6% of the hospitals, dedicated and specially equipped operating theaters for COVID-19–positive patients were not available. According to 72.9% of participants, COVID-19 had a substantial negative impact on academic activities, and 82.3% of the respondents agreed that their quality of life has been affected negatively by the pandemic. Finally, 92.5% of the participants believe that the pandemic will have a moderate to severe impact on the health system of their countries.

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Conclusions: Data collected in this survey provide insight into changes brought about in clinical and academic settings amid COVID-19. Along with shortages such as bed occupancy and personal protective equipment, it highlights negative impacts on academic and scientific activities, including the personal and social life of urologists.

Patient summary: It is essential to understand the impact of the coronavirus disease 2019 (COVID-19) pandemic on clinical, academic, and scientific urological activities, as well as on related personal and social issues.

1. Introduction

In late December 2019, a novel coronavirus disease (coronavirus disease 2019 [COVID-19]) was first reported in Wuhan, China, and rapidly spread across all the continents. On March 11, 2020, the World Health Organization (WHO) declared the outbreak as a pandemic. Most of the infected population developed a mild disease with symptoms such as fever, headache, dry cough, and diarrhea, whereas a small part of the population progressed to severe acute respiratory insufficiency and life-threatening disease [1,2].

The COVID-19 strain has overwhelmed the healthcare system of most European countries. Furthermore, hospitals are running out of intensive care unit beds and appropriate personal protective equipment (PPE). Very often a well-defined strategy to face COVID-19 patients is lacking, and the healthcare system is unable to provide the standard level of care to citizens with urological problems.

Since most of the urological departments have partially or predominantly been assigned to COVID-19 patients, the elective surgical activity inevitably decreased. Both the selection and the preoperative pathway of the patients waiting for elective surgery have undergone dramatic changes. Similarly, all academic, scientific, and educational activities have been affected significantly by the pandemic [3].

This survey aimed at better understanding the impact of the COVID-19 pandemic on the clinical, educational, and research activities in the field of urology in Europe, as well as on the personal and social consequences among representative urologists in Europe.

2. Materials and methods

The instrument used in this study was a survey including 37 questions clustered in four main sections. The first section included the demographics of the participants, while the remaining aimed to investigate the changes that have occurred in clinical practice and in academic, scientific, and educational activities, as well as the impact on personal and social aspects. The questionnaire was shared using the Survey Monkey platform (Palo Alto, CA, USA) to all the representatives of the main urological centers in Europe using the European Section of Urotechnology (ESUT) mailing list (including current and past members, as well as ESUT associates). An invitation e-mail was sent on April 10, 2020, and responses were recorded until April 15, 2020. Care was taken that only one urologist in the name of the institution completed the survey. The results were collected on a spreadsheet and analyzed thereafter using the Windows Excel software. Only complete questionnaires were included in the analysis.

3. Results

3.1. Demographics

A total of 107 recipients, affiliated to different hospitals from 22 countries, completed the survey. The mean age of the participants was 45 $\pm$ 9 (30–71) yr and most of them were males (94%). Most of the participants who had completed the survey were senior consultants and heads of department (43% and 29.9%, respectively). Board-certified urologists (14.0%), residents (4.7%), MCC/PhD students (1.9%), and clinical (4.7%) and research (1.9%) fellows represented the minor part of the respondents, and were asked to fill the survey with the consent/supervision of their respective heads and senior urologists.

Most of the centers involved were university and public hospitals (63.55% and 25.23%, respectively); the remaining were private clinics/hospitals (24.30%), tertiary care centers (9.35%), or government-based research hospitals (1.87%) (Table 1).

3.2. Clinical practice

Overall, COVID-19–infected patients occupied 37% of the total available beds. The bed occupancy within urological departments was reduced by 48.6% in order to hospitalize COVID-19 patients, and the reduction rate was correlated with the country's total cases and total deaths per million habitants at the date surveyed ($r = 0.359$, $p < 0.001$ and $r = 0.417$, $p < 0.001$, respectively). Furthermore, clinical activities were halted in 54.2% of respondents' hospitals due to the COVID-19 pandemic. Of the elective surgical procedures, 85% were cancelled because of the shortage of resources and an elevated risk of COVID-19 infection.

All the institutions changed their routine surgical plans in order to follow new preventive measures during the pandemic. Most of them (80.2%) decided to follow internal regulations, while only 19.8% followed international guidelines provided by urological societies or other medical/surgical associations.

The main reasons for the reduction of the workload in urological departments were attributed to hospital's

Table 1 – List of centers and countries involved

No.	Country	No. of responders
1	Austria	5
2	Belgium	4
3	Bosnia and Herzegovina	3
4	Bulgaria	1
5	Czech Republic	1
6	France	7
7	Germany	12
8	Greece	6
9	Italy	16
10	Macedonia	1
11	Montenegro	1
12	Netherlands	3
13	Poland	2
14	Portugal	3
15	Romania	2
16	Russia	7
17	Serbia	1
18	Spain	9
19	Switzerland	1
20	Turkey	13
21	Ukraine	2
22	UK	7
	Overall	107

management dispositions in 62.6% according to respondents. Other reasons were related to the patient's choice (35.5%), relocation of the urological staff, and use of urological facilities for treating COVID-19 patients (31.8%). In 20.6%, it was a personal decision made by the urologist.

In 82.2% of institutions, the preoperative pathway for patients waiting for elective surgery has changed compared with the prepandemic period. The COVID-19 confirmatory test was performed in asymptomatic and suspected cases (positive contact, clinical symptoms, cough, fever, etc.) in 41.1% and 42.1% of the centers, respectively. While 11.2% of the centers were performing computed tomography (CT) chest imaging routinely for all the patients attending surgery, 20.6% of them were scanning only suspected cases.

Before COVID-19, all the included hospitals were performing minimally invasive surgery (MIS). After the outbreak, only 64.49% of urological departments were using MIS for malignant disease and 10.3% for benign pathology, while 35.5% centers were not performing MIS at all. Among the centers performing MIS, 17.8% were using insufflation systems with integrated "active smoke evacuation mode" and 21.5% were using systems with an intelligent integrated flow system. On the contrary, 33.6% were still operating with standard two-way insufflators.

During the COVID-19 pandemic, 71% of the urologists were more concerned about bed occupancy than they were before the pandemic. Up to 52.3% of the urologists reported a shortage of medical staff, and the main reasons included sick leave (29%) and increased workload (25.2%) related to COVID-19 pandemic.

In 57.9% of the centers, COVID-19 positive patients were being operated only under urgent conditions, and only 8.4% of these centers were performing surgery for elective cases. More than one-third of the participants (33.6%) stated that COVID-19 patients have no longer been operated in their hospitals for any reason.

In 58% of the hospitals, dedicated and specially equipped operating theaters were available for COVID-19–positive patients. It is worth mentioning that in up to 17.1% of participating centers, in which only emergency cases were being operated, specially equipped operating rooms were not available. Nine respondents stated that they did not know about specially equipped operating theaters for COVID-19–positive patients in their centers. We could confirm that COVID-19–positive patients were not operated in four of these centers. Furthermore, 11 of the 62 participants, who stated that only emergency cases were operated in their centers, declared that specially equipped operating rooms were not available in their centers.

The availability of adequate PPE was always and almost always appropriate in 16.8% and 45.8% of the centers, respectively, and only 3.7% of the responders have declared an insufficient supply. According to almost all responders (96.3%), the use of PPE changed compared with the prepandemic period. Additionally, 31.8% of them were recruited to work as COVID-19 frontline care providers (Table 2).

3.3. *Academic/scientific activities*

Up to 72.9% of the participants believe that COVID-19 pandemic would have a substantial negative impact on scientific, academic, and educational activities. Before the outbreak, the mean time dedicated to research and education was 9.92 h/wk (ie, journal club sessions, grand rounds, interdisciplinary meetings, etc.), while during the pandemic it decreased to 4.78 h/wk. The majority of the participants (70.1%) were involved in tele-education and have been conducting remote meetings/grand rounds/lectures during the COVID-19 outbreak.

Additionally, 83.2% of the responders have been forced to cancel their travel plans to scientific meetings and

Table 2 – Demographic information

Demographic data	
No. of responders	107
Participating countries, *n*	24
Time to respond (s), SD (range)	480 ± 222 (125–976)
Age (yr), SD (range)	45 ± 9 (30–71)
Gender, *n* (%)	
Male	100 (93.46)
Female	7 (6.54)
Current position, *n* (%)	
Consultant (senior)	46 (42.99)
Head of department	32 (29.91)
Board-certified urologist (junior)	15 (14.02)
Resident	5 (4.67)
Clinical fellow	5 (4.67)
Research fellow	2 (1.87)
MSc/PhD student	2 (1.87)
Hospital type, *n* (%)	
University hospital	68 (63.55)
Public hospital	27 (25.23)
Private clinic/hospital	26 (24.30)
Tertiary center	10 (9.35)
Government-based research hospitals	2 (1.87)

SD = standard deviation.

congresses, and 88.8% of them have missed the opportunity to have an active role as a speaker (ie, accepted abstracts, scheduled lectures, workshops, etc.). About half of the respondents were involved in projects, trials, and laboratory experiments that are likely to be discontinued because of the COVID-19 pandemic outbreak.

3.4. *Personal and social aspects*

Approximately half of the respondents believe that the COVID-19 outbreak will have a substantial negative impact on their scientific, academic, and educational activities, and 82.3% feel that their quality of life will be affected negatively, with long-lasting consequences after the pandemic. Moreover, 92.5% of the responders believe that the pandemic will have a moderate to severe impact on the healthcare system of their own countries (Fig. 1).

4. Discussion

A recently published survey found that the bed occupancy in the urological departments was reduced by 48.6% in order to hospitalize COVID-19 patients, and the clinical activities were halted in 54.2% of the hospitals [4]. In our study, participants reported that up to 37% of total hospital beds were occupied by COVID-19 patients (Table 3). Additionally, more than half (52.3%) of the participants suffered problems related to the lack of personnel, with illness being the most frequent cause.

The bed occupancy has always been an important indicator for the hospital administrators [5]. The main reason for the reduced bed occupancy was the prohibition of the hospital managements (63%). Most of the participants (71.03%) declared to be more concerned about their reduced bed occupancy than before. The urologists were obligated under these extraordinary conditions to use the already reduced bed capacity, probably with a higher turnover, and its impact on the patients remains to be seen.

Strategies such as providing medical care only to a selected group of patients with nondeferrable or urgent conditions have been implemented. Moreover, there have been attempts to promote conservative treatment, limiting as much as possible the use of resources such as medications, hospital beds, and theaters for patients with elective conditions [6]. As seen in our study, elective urological surgeries decreased significantly by 85% during the pandemic and the preoperative pathway of the patients undergoing surgery has been modified in 82.24% of the participants' clinics aiming to increase the detection of positive cases. Indeed, the COVID confirmatory test was performed in almost half of nonsymptomatic and suspected cases. On the contrary, chest imaging was performed routinely in nonsymptomatic and suspicious cases only in the minority of centers. It has been shown that chest CT had a low rate of missed diagnosis of COVID-19 (4%), and may be useful as a standard method for the rapid identification of positive patients and optimization of the management. Moreover, authors showed that CT findings were able to detect infected patients before the laboratory results in almost 70% of cases [7].

The European Association of Urology (EAU) has recently published an updated version of guidelines, including the recommendation for patient selection and guiding urologists in their practice to optimize the resources [3,8,9]. How-

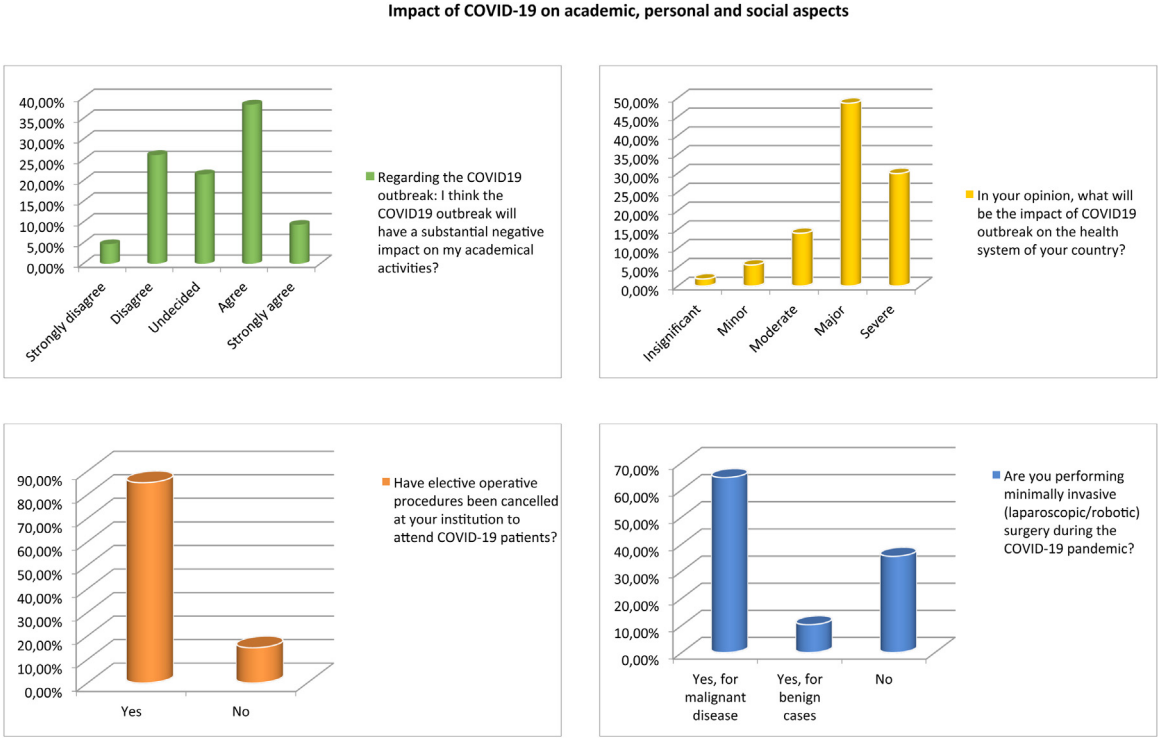

Fig. 1 – Impact of COVID-19 on academic, personal, and social aspects. COVID-19 = coronavirus disease 2019.

Table 3 – Summary of hospitals' clinical activities during COVID-19

Hospital data	
COVID-19 hospital's bed occupancy (%)	37.01
Urology bed reduction (%)	48.63
Modifications in clinical activity, *n* (%)	
Yes	58 (54.21)
No	45 (42.06)
Elective procedure cancellation, *n* (%)	
Yes	91 (85.05)
No	16 (14.95)
%	84
Main reason, *n* (%)	
Department assigned to COVID-19 pts	34 (31.78)
Hospital management prohibition	67 (62.62)
Patient's decision	38 (35.51)
Personal decision	22 (20.56)
Other	13 (12.15)
Follow recommendation/guidelines, *n* (%)	
Yes—international recommendations	18 (19.78)
Yes—internal protocols	73 (80.22)
No	0 (0)
Patients' preoperative pathway, *n* (%)	
COVID-19 test performed routinely	44 (41.12)
COVID-19 test in suspected cases	45 (42.06)
Chest CT performed routinely	12 (11.21)
Chest CT in suspected cases	22 (20.56)
No	19 (17.76)
Minimally invasive surgery, *n* (%)	
Yes—malignant cases	69 (64.49)
Yes—benign cases	11 (10.28)
No	38 (35.51)
Insufflation system, *n* (%)	
With integrated smoke evacuation	19 (17.76)
With intelligent flow system	23 (21.50)
Standard 2-way system	36 (33.64)
Concerns about bed occupancy, *n* (%)	
Yes	76 (71.03)
No	31 (28.97)
Shortage of medical staff, *n* (%)	
Yes—due to sickness	31 (28.97)
Yes—increased workload	27 (25.23)
No	51 (47.66)
Operating COVID-19–positive patients, *n* (%)	
Yes—elective and urgent	9 (8.41)
Yes—only urgent cases	62 (57.94)
No	36 (33.64)
Specially equipped theaters, *n* (%)	
Yes	62 (57.94)
No	36 (33.64)
PPE availability, *n* (%)	
Every time	18 (16.82)
Almost every time	49 (45.79)
Occasionally	29 (27.10)
Almost never	7 (6.54)
Never	4 (3.74)
PPE usage, *n* (%)	
Every time	42 (39.25)
Almost every time	37 (34.58)
Occasionally	24 (22.43)
Almost never	2 (1.87)
Never	2 (1.87)
Recruited as a front-line provider, *n* (%)	
Yes	34 (31.78)
No	73 (68.22)

COVID-19 = coronavirus disease 2019; CT = computed tomography; PPE = personal protective equipment; pts = patients.

ever, hospital management administrations have reacted mainly according to the country's ministry of health recommendations. All participants stated in our survey that their hospitals had, in some way, modified the routine model of care since the COVID-19 outbreak. Although most of the institutions created independent protocols (80.2%), 19.8% followed the recommendations contained in international guidelines. Recently though, urologists have shared the EAU COVID-19 guidelines in webinars and social media, which have gained wide acceptance among the European urological community and undoubtedly influenced medical practice.

An interesting aspect was also the fact that many urological departments continued to perform laparoscopic and robotic surgery. With regard to this, the EAU Robotic Urology Section (ERUS) released a version of emergency guidelines with recommendation focused on robotic surgery [8].

Along with maximal protection of healthcare professionals implementing the highest level of PPE and minimizing the side effects for patients with proper selection and testing, a proper use of the insufflation systems was recommended to avoid the aerosol spread of the virus [10]. Kwak et al [11] reported that hepatitis B virus has been detected in the surgical smoke during laparoscopic surgery. This issue may also be true for COVID-19, where small viral particles can be released along with surgical smoke during laparoscopic surgeries. Regarding this issue, our data showed that only 40% (18% smoke evacuation and 22% smart insufflation systems) of the respondents were using adequate smoke evacuation and insufflation systems [8].

Clearly defined pathways must be available to healthcare professionals when operating COVID-19–confirmed patients. Almost 70% of the responders stated that they had been operating COVID-19–positive patients, but most of them (57.9%) being only in case of urgent and nondeferrable conditions. All suspected COVID-19 patients requiring surgical intervention should be treated as positive until proven otherwise, in order to minimize the spread of infection [12].

In 33.64% of the hospitals, dedicated and specially equipped operating theaters were not available. The risk of infection can be minimized by ensuring an adequate air exchange cycle rate within the theaters and keeping the number of people working on COVID-19–positive cases as low as possible. Specifically allocated filter areas designed for COVID patients must be equipped with PPE, and any unnecessary equipment should be moved away from COVID patients' transit route [13]

The shortage of PPE due to COVID-19 pandemic is creating immense distress and heightened anxiety among healthcare workers [14]. In addition to general hygiene measures, it is suggested that different levels of protection should be adopted depending on the situation, and administrative measures are encouraged to minimize contact with infected patients [15,16]. In our study, more than half of the surveyed urologists (62.6%) stated that their center always or almost always had adequate PPE to cope with COVID-19 patients.

During the COVID-19 pandemic, the scientific, academic, and educational activities have also undergone profound

Table 4 – Scientific activities and quality of life (QoL) data

Scientific activities and QoL data	
Negative impact on scientific/academic/educational activities, *n* (%)	
Yes	78 (72.90)
Undecided	11 (10.28)
No	18 (16.82)
Time dedicated to academic activity (h/wk)	
Before COVID-19	9.9.2
After COVID-19	4.78
Remotely conducted meeting/grand rounds/lectures, *n* (%)	
Yes	75 (70.09)
No	32 (29.91)
Scientific meeting/congress cancellation, *n* (%)	
Yes	89 (83.18)
No	18 (16.82)
Abstract presentation/lecture/workshop scheduled, *n* (%)	
Yes	79 (88.76)
No	10 (11.24)
Inapplicable	82 (77)
Negative impact on QoL, *n* (%)	
Yes	88 (82.25)
Undecided	6 (5.61)
No	13 (12.15)
Impact on country's healthcare system, *n* (%)	
Severe	32 (29.91)
Major	52 (48.60)
Moderate	15 (14.02)
Minor	6 (5.61)
Insignificant	2 (1.87)

COVID-19 = coronavirus disease 2019.

changes. In a recent study, Amparore et al [17] reported with the pandemic that >40% of residents experienced a severe reduction of their clinical duties and >80% a complete suppression of clinical/surgical training activities. Their results are in line with our findings, 72.9% of the responders believed that the pandemic would have a negative impact on educational activities (Table 4). Our survey showed that the time spent on academic activities has been reduced to almost half during the pandemic (9.92 vs 4.78 h/wk).

Owing to staff reassignment to other services, many of the normal duties have been changed, affecting the goals set for the doctors in training either residents or fellows [18]. In the same way, many academic and scientific activities have been compromised; most of the responders (83.1%) had planned to attend at least one scientific meeting, with most of them (88.8%) having also an active role scheduled (abstract presentation, lecture, workshop, etc.).

In order to minimize the negative impact of the COVID-19 pandemic on scientific, academic, and educational activities, alternative teaching and learning modalities have been adopted [19]. When we inquired participants about tele-education, 70.1% of them declared that they have been involved in any form of remote learning during the pandemic. However, some limitations may exist for those who are not familiar with the use of technologies [20].

Finally, it is worth mentioning that a significant percentage of the participants (82.3%) stated that their quality of life has been affected negatively by the pandemic, and the vast majority (92.5%) believes that it will have a moderate to severe impact on the health system of their own country.

The main strength of our study is the completeness of the data and the selection of one representative per center. The percentage of fulfilled surveys was >90%, and only complete surveys were included in the analysis. The time from the invitation to the collection of data was short, showing good adherence to the survey. Moreover, the responders were mainly urologists with a senior position (consultant and head of department), with a clear view of the situation and access to the numbers of their own centers. Only a few responders were residents and fellows, and they have filled the survey under the supervision of their senior urologists and/or management officials. Our aim is to extend the invitation to centers all around the world to have a wider vision of the situation. Once the pandemic settles down, the extent of the impact of all the measured parameters has to be re-evaluated. A further follow-up study is also planned to assess the change in the guideline consulted following the pandemics' initial phase.

5. Conclusions

The data collected in this survey provide valuable information about the changes that occurred in clinical and academic settings across the major urological centers in Europe. It outlines the situation regarding the shortage of resources such as bed occupancy and the availability of PPE. It also highlights the negative impact of the pandemic on scientific, academic, and educational activities, as well as on personal and social life of urologists and other healthcare providers. Finally, some positive aspects should be considered as the implementation of new communication channels such as teleconferences as well as new online platforms for "smart working" and educational purposes.

***Author contributions*:** Ali S. Gözen had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.*Study concept and design*: Heinze, Umari, Gözen.
Acquisition of data: Guven.
Analysis and interpretation of data: Basulto-Martínez.
Drafting of the manuscript: Heinze, Umari, Guven.
Critical revision of the manuscript for important intellectual content: Gözen, Rassweiler.
Statistical analysis: Suárez-Ibarrola.
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