

How has the COVID-19 pandemic impacted Polish urologists? Results from a national survey

Pawel Rajwa¹, Mikołaj Przydacz², Piotr Zapala³, Gniewko Wieckiewicz⁴, Jakub Ryszawy¹, Dominik Chorągwicki², Rafał B. Drobot⁵, Piotr Radziszewski³, Andrzej Paradysz¹, Piotr L. Chłosta²

¹Department of Urology, Medical University of Silesia, Zabrze, Poland

²Department of Urology, Jagiellonian University Medical College, Cracow, Poland

³Department of General, Oncological and Functional Oncology, Medical University of Warsaw, Warsaw, Poland

⁴Chair and Clinical Department of Psychiatry, Medical University of Silesia, Katowice, Poland

⁵Department of Urology and Urological Oncology, Multidisciplinary Hospital in Warsaw-Międzylesie, Warsaw, Poland

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Corresponding author

Pawel Rajwa

Department of Urology
Medical University
of Silesia

14-15 3 Maja Street
41-800 Zabrze, Poland
pawelgrajwa@gmail.com
phone: +48 323 704 454

Introduction Poland was initially less affected by the coronavirus disease 2019 (COVID-19) pandemic, however, severe restrictions, and health care restructuring have impacted all areas of medicine, including urology. Therefore, we aimed, via an online survey, to examine the impact of the COVID-19 pandemic on Polish urologists and urology residents.

Material and methods Between May 15 and June 6, 2020, 229 (28.63% response rate) urologists and urology residents responded to a 28-question online survey. The questionnaire analyzed basic demographic and professional characteristics, and the impact of the COVID-19 pandemic on physicians' everyday work, mental status as well as private life. We further compared the differences between the selected subgroups.

Results Nearly all (96.5%) responders claimed that the pandemic had a moderate to high impact on their everyday clinical practice with the majority of the residents (62.0%) believing that the COVID-19 pandemic will harm their training. Most responders (86.9%) reported over 25% declines in outpatient clinic consultations and 55.9% claimed that their income dropped over 25%. Only 38.9% wanted telemedicine to permanently replace some of the consultations after the pandemic, with residents being significantly more positive about this modality (51.4% vs. 33.1%; $p = 0.01$). Interestingly, 79.9% noticed the negative psychological effect of the pandemic on their colleagues, and 57.6% felt increased anxiety, sadness, or stress.

Conclusions This study revealed the complaints and needs of Polish urologists and urology residents after the first wave of the COVID-19 pandemic. There was a significantly negative impact on their work, mental health, and private life.

Key Words: COVID-19 ↔ urology ↔ resident ↔ Poland ↔ survey

INTRODUCTION

In late 2019, the spread of the novel coronavirus disease 2019 (COVID-19) had started, with massive outbreaks in countries and territories worldwide causing global economic, public health, and social crises [1]. Poland, the second most-populated

Central European country, faced delayed and lower COVID-19 incidence rates, and contrary to regions more affected by the pandemic, did not observe saturation of hospitals [2, 3]. In line with major medical organizations' recommendations, numerous measures were undertaken to mitigate the negative impact of the COVID-19 surge including

the postponement of elective surgeries, implementation of telemedicine, shift-work, and higher uptake of personal protective equipment (PPE) [4, 5]. Nevertheless, despite initial success with flattening the COVID-19 incidence curve, escalating restrictions, further health care restructuring (including the opening of COVID-19-dedicated hospitals), and unexplored COVID-19 fear likely led to indirect adverse effects of the pandemic also impacting Polish physicians and their work. Therefore, COVID-19, a droplets-transmitted respiratory infection, despite not being in the initial scope of treatment of urologists, has impacted all areas of urology including emergencies, outpatient clinics, elective surgeries, as well as physicians' everyday lives [6, 7].

Up to now, no data was available on the impact of the COVID-19 pandemic on urologists and urology residents in Poland. For that reason, we aimed to examine via online, nationwide survey changes that occurred in hospital work, outpatients clinics, and the everyday life of Polish urologists after the initial wave of the pandemic.

MATERIAL AND METHODS

This online survey was conducted under the auspices of the Polish Urological Association (PUA) and distributed via a mailing list to all PUA members within the active mailing list. Between May 15 and June 6, 2020 (two months after initial restrictions were implemented) 229 (28.63% response rate) participants responded to the survey reachable via Google Form[®]. The questionnaire included 28 questions analyzing pre-COVID-19 practice and the impact of the COVID-19 pandemic on physicians' everyday work, mental status as well as private life. The questions were closed-ended and both single as well as multiple choice. The survey was assessed by the local ethics committee (Silesian Medical Chamber) and determined that approval for this type of questionnaire was not necessary (decision No. SIL.KB.748.2020).

Statistical methods

Continuous variables are presented as median values accompanied by interquartile ranges. Consecutive survey answers were utilized for stratification issues. Differences between groups were evaluated with the U Mann-Whitney test for continuous variables and with the Fischer's exact test for categorical variables. For all statistical analyses, a two-sided p-value <0.05 was considered statistically significant. Statistical analyses were performed with the SAS System (version 9.4).

RESULTS

The basic characteristics of all 229 responders are detailed in Table 1. Briefly, 31.44% of all responders were residents, with the majority of doctors working in hospitals (89.52%) and outpatient clinics (93.45%). Almost all (96.5%) claimed that the pandemic had a moderate to high impact on their everyday clinical practice with the majority of the residents believing that the COVID-19 pandemic will harm their training. Nearly 20% of all doctors worked in COVID-19 dedicated centers, out of whom 38.89% were residents (Table 2). A total of 85.59% of all responders believed that they were at medium to very high risk of being infected with SARS-CoV-2, while only 3.93% assumed that they would develop the most severe form of COVID-19. The majority of responders (56.77%) knew someone who was infected with SARS-CoV-2 and 11.79% were obligatorily quarantined, due to close, unprotected contact with COVID-19 (Table 2). Importantly, approximately 40% felt that there is no free and rapid access to COVID-19 testing. Two-thirds wore more than one type of personal protective equipment (PPE),

Table 1. Responders' basic characteristics

Total responders	229
Urologists	157 (68.56%)
Residents	72 (31.44%)
Sex	
Male	198 (84.46%)
Female	31 (13.54%)
Age (median, IQR)	42 (33–58)
Hospital	
Yes	205 (89.52%)
Public	160 (78.05%)
Private	11 (5.37%)
Both	34 (16.59%)
No	24 (10.48%)
Public hospital	
Yes	194 (84.72%)
University	59 (30.41%)
Not University	135 (69.87%)
No	35 (15.28%)
Outpatient clinics	
Yes	214 (93.45%)
Private	55 (25.70%)
Public	41 (19.16%)
Both	118 (55.14%)
No	15 (7.01%)
Have you used telemedicine in outpatient clinics before the COVID-19 pandemic?	
No	129 (56.33%)
Yes, <10% visits	41 (17.90%)
Yes, 11–25% visits	22 (9.61%)
Yes, 26–50% visits	13 (5.68%)
Yes, >50% visits	24 (10.48%)

COVID-19 – coronavirus disease 2019; IQR – interquartile range

Table 2. Impact of the COVID-19 pandemic on urologists

Dedicated COVID-19 hospital	
Yes	36 (18.56%)
No	158 (81.44%)
Directly involved in COVID-19 patients treatment?	
Yes	20 (8.73%)
No	209 (91.27%)
Have you ever directly contacted a COVID-19 patient?	
Yes	56 (24.45%)
No	173 (75.55%)
Do you know anyone who was infected with SARS-CoV-2?	
Yes	130 (56.77%)
No	99 (43.23%)
Have you ever been obligatorily quarantined?	
Yes	27 (11.79%)
No	202 (88.21%)
How has the COVID-19 pandemic impacted your everyday clinical practice?	
Highly	176 (76.86%)
Moderately	45 (19.65%)
Little	5 (2.18%)
Not at all	3 (1.31%)
[Urologists in-training] Do you think that the COVID-19 pandemic will negatively affect your specialization training in urology?	
Definitely yes	31 (43.06%)
Rather yes	14 (18.92%)
Rather no	22 (30.56%)
Definitely no	5 (6.94%)
Not applicable	157
How do you assess your risk of SARS-CoV-2 infection?	
Very high	10 (4.37%)
High	56 (24.45%)
Medium	130 (56.77%)
Low	30 (13.10%)
None	3 (1.31%)
On a scale of 1–5, how do you assess the potential course of COVID-19 (1 – very mild, 5 – very severe):	
5	9 (3.93%)
4	22 (9.61%)
3	80 (34.93%)
2	64 (27.95%)
1	54 (23.58%)
When admitting patients without suspicion of COVID-19, do you wear (multiple choice question):	
Surgical mask	166 (72.49%)
FFP2 or FFP3 mask	88 (38.43%)
Face shield	114 (49.78%)
Protective goggles	49 (21.40%)
Medical gown	88 (38.43%)
No PPE	3 (1.31%)
Does your main worksite provide sufficient PPE?	
Definitely yes	46 (20.09%)
Rather yes	114 (49.78%)
Rather no	37 (16.16%)
Definitely no	21 (9.17%)
Don't know	11 (4.80%)
Has the access to PPE improved since the beginning of the pandemic?	
Definitely yes	82 (35.81%)
Rather yes	98 (42.79%)
Rather no	25 (10.92%)
Definitely no	5 (2.18%)
Don't know	19 (8.30%)

Table 2. Continued

Do you feel there is free and rapid access to rapid genetic testing?	
Definitely yes	69 (30.13%)
Rather yes	67 (29.26%)
Rather no	47 (20.25%)
Definitely no	26 (11.35%)
Don't know	20 (8.73%)
How many estimated fewer patients do you have on an outpatient basis compared to the pre-COVID-19 pandemic?	
No change, or change <10%	9 (4.21%)
11–25% decrease	17 (7.94%)
26–50% decrease	61 (28.50%)
>50% decrease	125 (58.41%)
>10% increase	2 (0.93%)
Not applicable	15
How much of all consultations do you currently perform using telemedicine?	
Not at all	51 (22.27%)
Yes, <10% visits	57 (24.89%)
Yes, 11–25% visits	37 (16.16%)
Yes, 26–50% visits	23 (10.04%)
Yes, >50% visits	61 (26.63%)
Would you like telemedicine to permanently replace some face-to-face consultations in the future?	
Yes	89 (38.86%)
No	140 (61.14%)
During the COVID-19 pandemic, your earnings:	
Have not changed or changed <10%	42 (18.34%)
11–25% decrease	54 (23.58%)
26–50% decrease	74 (32.31%)
>50% decrease	54 (23.58%)
>10% increase	5 (2.18%)
Have you noticed that your colleagues show an increased level of anxiety, sadness or stress than usual during the pandemic?	
Definitely yes	78 (34.06%)
Rather yes	105 (45.85%)
Rather no	43 (18.78%)
Definitely no	3 (1.31%)
Have you noticed an increased feeling of anxiety, sadness or stress than usual?	
Definitely yes	39 (17.03%)
Rather yes	93 (40.61%)
Rather no	71 (31.00%)
Definitely no	26 (11.35%)
What do you think during the COVID-19 pandemic affects your psyche the most (multiple choice question)?	
The fear of being infected by/with SARS-CoV-2	71 (31.00%)
The fear of relatives being infected by/with SARS-CoV-2	118 (51.53%)
Change of work mode/style	85 (37.12%)
Lower income	95 (41.48%)
Isolation and restrictions	119 (51.97%)
Uncertainty regarding the pandemic duration	157 (68.56%)
Others	12 (5.24%)
How has the COVID-19 pandemic affected your family relations?	
Highly	49 (21.40%)
Moderately	66 (28.82%)
Little	60 (26.20%)
Not at all	54 (23.58%)

COVID-19 – coronavirus disease 2019; IQR – interquartile range; PPE – personal protective equipment

Table 3. Comparisons of selected groups

	Urologists	Residents	p-value	University Hospital	Non-University Hospital	p-value	COVID-19 dedicated centers	Non-COVID-19 dedicated centers	p-value
Age (median, IQR)	52 (21)	31 (4)	<.01	37 (22)	45 (25)	.03	37.5 (20.5)	44 (25)	.49
Sex (% male)	137 (87.3%)	61 (84.7%)	.68	147 (86.5)	51 (86.4)	.05	31 (86.1%)	167 (86.5%)	1
How has the COVID-19 pandemic impacted your everyday clinical practice?			.61			.52			.66
Highly	120 (76.4%)	56 (77.8%)		133 (78.2%)	43 (72.9%)		31 (86.1%)	145 (75.1%)	
Moderately	32 (20.4%)	13 (18.1%)		30 (17.7%)	15 (25.4%)		5 (13.9%)	40 (20.7%)	
Little	4 (2.6%)	1 (1.4%)		4 (2.4%)	1 (1.7%)		0 (0%)	5 (2.6%)	
Not at all	1 (0.6%)	2 (2.8%)		3 (1.8%)	0 (0%)		0 (0%)	3 (1.6%)	
Does your main worksite provide sufficient PPE?			.07			.36			<.01
Definitely yes	30 (19.1%)	16 (22.2%)		13 (22%)	33 (19.4%)		16 (44.4%)	30 (15.5%)	
Rather yes	87 (55.4%)	27 (37.5%)		25 (42.4%)	89 (52.4%)		15 (41.7%)	99 (51.3%)	
Rather no	20 (12.7%)	17 (23.6%)		9 (15.3%)	28 (16.5%)		4 (11.1%)	33 (17.1%)	
Definitely no	12 (7.6%)	9 (12.5%)		9 (15.3%)	12 (7.1%)		0 (0%)	21 (10.9%)	
Don't know	8 (5.1%)	3 (4.2%)		3 (5.1%)	8 (4.7%)		1 (2.8%)	10 (5.6%)	
Have you noticed that your colleagues show an increased level of anxiety, sadness or stress than usual during the pandemic?			.17			.09			.07
Definitely yes	49 (31.2%)	29 (40.3%)		13 (22%)	65 (38.2%)		17 (47.2%)	61 (31.6%)	
Rather yes	78 (49.7%)	27 (37.5%)		34 (57.6%)	71 (41.8%)		17 (47.2%)	88 (45.6%)	
Rather no	29 (18.5%)	14 (19.4%)		11 (18.6%)	32 (18.8%)		2 (5.6%)	41 (5.6%)	
Definitely no	1 (0.6%)	2 (2.8%)		1 (1.2%)	2 (1.7%)		0 (0%)	3 (1.6%)	
Have you noticed an increased feeling of anxiety, sadness or stress than usual?			.76			.45			.33
Definitely yes	24 (15.3%)	15 (20.8%)		8 (13.6%)	31 (18.2%)		10 (27.8%)	29 (15%)	
Rather yes	65 (41.4%)	28 (38.9%)		21 (35.6%)	72 (42.4%)		14 (38.9%)	79 (40.9%)	
Rather no	49 (31.2%)	22 (30.6%)		21 (35.6%)	50 (29.4%)		9 (25%)	62 (32.1%)	
Definitely no	19 (12.1%)	7 (9.7%)		9 (15.3%)	17 (10%)		3 (8.3%)	23 (11.9%)	
Has the access to PPE improved since the beginning of the pandemic ?			.72			.13			.02
Definitely yes	58 (36.9%)	24 (33.3%)		26 (44.1%)	56 (32.9%)		22 (61.1%)	60 (31.1%)	
Rather yes	65 (41.4%)	33 (45.8%)		24 (40.7%)	74 (43.5%)		9 (25%)	89 (46.1%)	
Rather no	19 (12.1%)	6 (8.3%)		2 (3.4%)	23 (13.5%)		2 (11.9%)	23 (5.6%)	
Definitely no	4 (2.6%)	1 (1.4%)		2 (3.4%)	3 (1.8%)		1 (2.8%)	4 (2.1%)	
Don't know	11 (7%)	8 (11.1%)		5 (8.5%)	14 (8.2%)		2 (8.8%)	17 (5.6%)	
Do you feel there is free and rapid access to the rapid genetic testing?			.49			<.01			.35
Definitely yes	47 (29.9%)	22 (30.6%)		25 (42.4%)	44 (25.9%)		15 (41.7%)	54 (28%)	
Rather yes	44 (28%)	23 (31.9%)		20 (33.9%)	47 (27.7%)		11 (30.6%)	56 (29%)	
Rather no	30 (19.1%)	17 (23.6%)		10 (17%)	37 (21.8%)		7 (19.4%)	40 (20.7%)	
Definitely no	19 (12.1%)	7 (9.7%)		4 (6.8%)	22 (12.9%)		2 (5.6%)	24 (12.4%)	
Don't know	17 (10.8%)	3 (4.2%)		0 (0%)	20 (11.8%)		1 (2.8%)	19 (9.8%)	
During the COVID-19 pandemic, your earnings:			.02			<.01			.02
Have not changed or changed <10%	21 (13.4%)	21 (29.2%)		14 (23.7%)	28 (16.5%)		4 (11.1%)	38 (19.7%)	
11–25% decrease	40 (25.5%)	14 (19.4%)		16 (27.1%)	38 (22.4%)		5 (13.9%)	49 (25.4%)	
26–50% decrease	52 (33.1%)	22 (30.6%)		25 (42.4%)	49 (28.8%)		11 (30.6%)	63 (32.6%)	
>50% decrease	42 (26.8%)	12 (16.7%)		4 (6.8%)	50 (29.4%)		13 (36.1%)	41 (21.2%)	
>10% increased	2 (1.3%)	3 (4.2%)		0 (0%)	5 (2.9%)		3 (8.33)	2 (1%)	
Do you think that the COVID-19 pandemic indirectly affected your family relationships?			.85			.42			.32
Yes, highly	33 (21%)	16 (22.2%)		13 (22%)	36 (21.2%)		9 (25%)	40 (20.7%)	
Yes, moderately	48 (30.6%)	18 (25%)		18 (30.5%)	48 (28.2%)		14 (38.9%)	52 (26.9%)	
Yes, barely	40 (25.5%)	20 (27.8%)		11 (18.6%)	49 (28.8%)		6 (16.7%)	54 (28%)	
No	36 (22.9%)	18 (25%)		17 (28.8%)	37 (21.8%)		7 (19.4%)	47 (24.4%)	

Table 3. Continued

	Urologists	Residents	p-value	University Hospital	Non-University Hospital	p-value	COVID-19 dedicated centers	Non-COVID-19 dedicated centers	p-value
How do you assess your risk of SARS-CoV-2 infection?			.92			.07			.45
Very high	7 (4.5%)	3 (4.2%)		4 (6.8%)	6 (3.5%)		3 (8.3%)	7 (3.6%)	
High	39 (24.8%)	17 (23.6%)		10 (17%)	46 (27.1%)		10 (27.8%)	46 (23.8%)	
Medium	87 (55.4%)	43 (59.7%)		32 (54.2%)	98 (57.7%)		17 (47.2%)	113 (58.6%)	
Low	21 (13.4%)	9 (12.5%)		13 (22%)	17 (10%)		6 (16.7%)	24 (12.4%)	
None	3 (1.9%)	0 (0%)		0 (0%)	3 (1.8%)		0 (0%)	3 (1.6%)	
Have you used telemedicine in outpatient clinics before the COVID-19 pandemic?			.05			.42			.86
No	82 (52.2%)	47 (65.3%)		30 (50.9%)	99 (58.2%)		20 (55.6%)	109 (56.5%)	
Yes, <10% visits	28 (17.8%)	13 (18.1%)		11 (18.6%)	30 (17.7%)		7 (19.4%)	34 (17.6%)	
Yes, 11–25%	17 (10.8%)	5 (6.9%)		6 (10.2%)	16 (9.4%)		2 (5.6%)	20 (10.4%)	
Yes, 26–50% visits	13 (8.3%)	0 (0%)		4 (6.8%)	9 (5.3%)		2 (5.6%)	11 (5.7%)	
Yes, >50% visits	17 (10.8%)	7 (9.7%)		8 (13.6%)	16 (9.4%)		5 (13.9%)	19 (9.8%)	
Do you use telemedicine now?			.48			.75			.08
No	33 (21%)	18 (25%)		41 (24.1%)	10 (17%)		15 (41.7%)	36 (18.7%)	
Yes, <10% visits	42 (26.8%)	15 (20.8%)		40 (23.5%)	17 (28.8%)		6 (16.7%)	51 (26.4%)	
Yes, 11–25% visits	28 (17.8%)	9 (12.5%)		27 (15.9%)	10 (17%)		4 (11.1%)	33 (17.1%)	
Yes, 26–50% visits	13 (8.3%)	10 (13.9%)		16 (9.4%)	7 (11.9%)		3 (8.3%)	20 (10.4%)	
Yes, >50% visits	41 (26.1%)	20 (27.8%)		46 (27.1%)	15 (25.4%)		8 (22.2%)	53 (27.5%)	
Would you like telemedicine to permanently replace some traditional advice in the future?			.01			.36			.07
Yes	52 (33.1%)	37 (51.4%)		26 (44.1%)	63 (37.1%)		9 (25%)	80 (41.5%)	
No	105 (66.9%)	35 (48.6%)		33 (55.9%)	107 (62.9%)		27 (75%)	113 (58.6%)	
On a scale of 1–5, how do you assess the potential course of COVID-19 (1 – mild, 5 – very severe):			<.01			.42			.06
5	8 (5.1%)	1 (1.4%)		1 (1.7%)	8 (4.7%)		3 (8.3%)	6 (3.1%)	
4	19 (12.1%)	3 (4.2%)		3 (5.1%)	19 (11.2%)		3 (8.3%)	19 (9.8%)	
3	63 (40.1%)	17 (23.6%)		19 (32.2%)	61 (35.9%)		14 (38.9%)	66 (34.2%)	
2	41 (26.1%)	23 (31.9%)		20 (33.9%)	44 (25.9%)		8 (22.2%)	56 (29%)	
1	26 (16.6%)	28 (38.9%)		16 (27.1%)	38 (22.4%)		8 (22.2%)	46 (23.8%)	
How many estimated fewer patients do you have on an outpatient basis compared to the pre-COVID-19 pandemic?			.33			.25			.18
No change, or change <10%	7 (4.5%)	8 (11.1%)		4 (6.8%)	11 (6.5%)		2 (5.6%)	13 (6.7%)	
11–25% decrease	14 (8.9%)	6 (8.3%)		4 (6.8%)	16 (9.4%)		1 (2.8%)	19 (9.8%)	
26–50% decrease	46 (29.3%)	17 (23.6%)		22 (37.3%)	41 (24.1%)		6 (16.7%)	57 (29.5%)	
>50% decrease	89 (56.7%)	40 (55.6%)		28 (47.5%)	101 (59.4%)		27 (75%)	102 (52.9%)	
>10% increase	1 (0.64%)	1 (1.4%)		1 (1.7%)	1 (0.6%)		0 (0%)	2 (1%)	
Have you ever directly contacted a COVID-19 patient?			<.01			.09			<.01
Yes	30 (19.1%)	26 (36.1%)		15 (25.4%)	41 (24.1%)		22 (61.1%)	34 (17.6%)	
No	127 (80.9%)	46 (63.9%)		44 (74.6%)	129 (75.9%)		14 (38.9%)	159 (82.4%)	

with most responders wearing a simple surgical mask when consulting patients without suspicion of COVID-19. Most of the responders felt that their main worksite provided PPE (definitely yes: 20.09%; rather yes: 49.78%), with 78.60% believing that the availability of PPE has improved since the outbreak in March, 2020. Moreover, 86.92% of doctors reported over 25% declines in outpatient consultations and 55.90% claimed that their income dropped over 25%. During the COVID-19 era, high uptake of telemedi-

cine was indicated with 77.73% of responders indicating the implementation of this approach, comparing to 43.67% that used it before COVID-19. Of note, 61.14% of responders did not want telemedicine to permanently replace some of the consultations after the pandemic. Interestingly, 79.91% of physicians noticed the negative psychological effect of the pandemic on their colleagues, and 57.64% felt increased anxiety and sadness. Responders were mostly distressed due to the possibility of transmitting the

infection to their relatives (51.53%), implemented restrictions (51.97%) and uncertainty regarding pandemic duration (68.56%). Interestingly, the fear of COVID-19 infection was the least mentioned cause of anxiety (31%). More than three-quarters (76.43%) indicated a negative impact on their family relations.

Comparing changes between urology residents and specialists, more urologists claimed that their income was negatively affected ($p = 0.02$), whereas residents were more positive for telemedicine to replace some of the face-to-face consultations after the pandemic ($p = 0.01$) (Table 3). Urologists in-training believed that in a case of infection they would have milder symptoms ($p < 0.01$), with no differences of precepted infection risk. We further compared physicians working in the university vs. non-university hospitals. Urologists and urology residents working in university hospitals indicated better access to COVID-19 testing ($p < 0.01$). Taking into account the present national debate, the evaluation of the COVID-19 dedicated centers was of particular interest. All of the physicians working in the COVID-19 dedicated hospitals claimed that the pandemic had a moderate (13.9%) or high (86.1%) impact on their clinical practice, with no 'little' and 'not at all' answers. Also, better access to PPE was more frequently indicated ($p = 0.002$). Also, non-significantly more urologists and residents who worked in COVID-19 centers indicated increased anxiety, sadness, or stress in both themselves (66.7%) and in their colleagues (94.4%), when compared to physicians working in non-COVID-19 centers (55.9%; $p = 0.33$ and 77.2%; $p = 0.07$, respectively). There were also other borderline significant results, such as more urologists and residents working in the COVID-19 centers indicating $>50\%$ earnings decreases as compared to those not in COVID-19 dedicated centers (36.1% vs. 21.2%)

DISCUSSION

Our study indicates that the COVID-19 pandemic has deeply and negatively influenced Polish urologists and urology residents, in terms of clinical practice, financial situation, mental health, and family life. The majority of the responders believed that they were at significant infection risk, and the present situation deeply changed their lives leading to increased stress, anxiety, and sadness. In clinical work, the unparalleled popularity of telemedicine (remaining undesired as indicated by the results), decreased number of outpatient consultations, and higher uptake of PPE seem to be the pivotal changes. In private life, decreased income, a strong impact

on family relations, and higher anxiety were also indicated. Of note, Polish urologists and urology residents were mostly worried about the uncertain future, and family members' health, but not their own risk of infection. Residents were generally more open to telemedicine, with their earnings being less affected by the present situation. However, more than half of the residents were worried that the pandemic will negatively affect their training.

In this paper, we present the first, nationwide survey, which allowed us to indirectly evaluate the impact of the COVID-19 pandemic on Polish urologists and urology residents. Our survey comprehensively evaluated information on broad aspects of life, and therefore, serves as a robust picture of urologists' complaints after the first wave of the COVID-19 pandemic. We believe that we obtained a good response rate with unambiguous answers, that allow us to draw some conclusions, which will be useful to improve the understanding of Polish urologists' problems and management of health care providers' distresses. Despite our results seeming to be exclusive for the Polish situation, as Poland was somehow differently affected by the pandemic than most of the European countries, they can be also applied to other countries with similar, public health care systems.

Firstly, during the initial phase of the COVID-19 surge, major global, as well as Polish organizations recommended postponement of elective procedures, implementation of shift-work as well as telemedicine to preserve essential health care sectors and to minimize the risk of nosocomial infections, which were initially one of the most common sources of transmission [3]. This restructuring was rapidly introduced and led to an unprecedented disruption of hospital and outpatient services. Our online survey indicates that almost all of the Polish urologists and urologists in-training felt that the COVID-19 pandemic has affected their clinical practice. These results reveal the severity and significance of the implemented changes for urologists. Similar results were obtained in other surveys conducted worldwide [6, 7, 8]. For example, in Germany, 97% of urologists indicated that their routine work was moderately to very strongly impacted by the COVID-19 pandemic, with only 0.3% believing that the outbreak did not affect their work [7]. These interesting results illustrate that urologists in Poland, which initially faced significantly lower COVID-19 incidence and mortality rates than Germany, have experienced comparable perceived disruption in their everyday clinical work. Considering a maximum of 30% of occupied beds in COVID-19 dedicated hospitals, presumably, the undertaken measurements restricting non-COVID-19 health care provision were too drastic, although ex-

plicable considering earlier affected countries' experiences.

Secondly, another important finding is the reported decrease in the number of outpatient consultations. Over 58% of urologists and residents claimed that two months after the first COVID-19 cases, there was an over 50% decline in ambulatory care. This is presumably a consequence of COVID-19 fear, health care system restructuration, and social restrictions. This phenomenon is especially alarming, as it does not seem inconsequential [9]. In our recent study, evaluating data from 13 Polish urological emergency departments, there was a 66% increase in urological device malfunction cases during the COVID-19 era, which should usually be controlled and exchanged on regular outpatient visits. Furthermore, patients during the initial phase of the COVID-19 surge presented with more serious complaints as compared to patients in 2019 [9].

Almost twice the amount of Polish urologists were using telemedicine during the COVID-19 pandemic, compared to pre-COVID-19 period. Nevertheless, despite more positive receipts from residents, the majority of responders did not want this approach to become the standard of care after the pandemic. This is of particular interest, as before the COVID-19 pandemic over two-fifths of responders had already implemented, to varying degrees, telemedicine in their clinics. The factors underlying this aversion could be the rapid, unprepared telemedicine introduction at an extremely broad scale, with a general indication of the avoidance of face-to-face visits and low to no selection of patients, who could safely be treated using this modality [9]. Generally, previous experiences with telemedicine in urology were very promising and truly beneficial in selected patients [10, 11]. Possibly, a slower, more structured introduction with the pre-training of both, physicians and patients, as implemented in other countries, could change the perception of Polish urologists [12].

Over half of the responders indicated that they felt increased anxiety, sadness, and stress, and even more (approximately 80%) had noticed negative psychological features in their co-workers. Urologists and urology residents indicated that they were least stressed by the possibility of being infected and mostly anxious about the uncertain future, restrictions, and safety of their family. Also, the majority of urologists indicated the negative impact of the pandemic on their family relations and finances. It should be recognized that psychological well-being is now particularly strained, as the COVID-19 situation is an additional risk factor to urologists' mental health, who were already at risk due to working

in the medical field [13]. A recent systematic review and meta-analysis from August 2020 which analyzed various mental health issues among healthcare workers during the COVID-19 pandemic reported a pooled prevalence rate of anxiety of 22.8% from 12 different studies [14]. The fact that the number of urologists who felt increased levels of anxiety and sadness compared to their usual state of mental health was higher than the prevalence of anxiety among all of the healthcare workers during COVID-19 is alarming. Due to the fact that diagnosing an anxiety disorder is not possible with any self-assessment tool as it requires psychiatric examination, the authors believe that easy access to mental health specialists should be immediately provided for urologists who believe that they need support. Undoubtedly, the worse mental condition may have some indirect effect on work and personal relations of Polish medical staff in urological departments and requires a systemic response from major Polish urological and other organizations.

At the initial peak of the pandemic, there was a global shortage of PPE. In a recent study evaluating crowdfunding during the initial phase of the COVID-19 pandemic, most of the European campaigns were fundraising for hospitals and medical supplies, as there were severe shortages of PPE and other medical equipment [15]. Two months after the outbreak in Poland, more than 1 in 5 responders still indicated that their main worksite did not provide sufficient PPE. However, it is truly optimistic that only 13% indicated that access to PPE did not improve since the beginning of the pandemic. Besides, most of the responders wore simple surgical masks in addition to other protection (including a face shield) when consulting non-COVID-19 patients, which may not provide full protection against a SARS-CoV-2 infection, but can be explained by given PPE shortages and costs. Interestingly, given relatively low COVID-19 incidence rates in Poland, a significant number of Polish urologists and urology residents had contact with COVID-19, including over 11% being obligatorily quarantined due to unprotected contact with a person infected with SARS-CoV-2.

There are several potential limitations of our study. This is a single-country, and single-specialty focused survey, which limits its broad applicability. Furthermore, we were not able to obtain a higher response rate and check how many people had received the invitation for completing the survey. Also, we did not use a validated questionnaire to assess the psychological status of urologists, and the survey questions were based and chosen on the authors' consensus meeting. Lastly, the answers were obtained within 3 weeks, so given the dynamic COVID-19 situation,

the responders may have responded in slightly different circumstances.

CONCLUSIONS

Taken together, this study highlights the complexities of the COVID-19 pandemic consequences and their strong impact on Polish urologist and urology residents. The isolation restrictions, rapid health

care restructuring, and COVID-19 fear have led to major changes including higher telemedicine uptake, declines in outpatient consultations, and increased anxiety among physicians. We believe that our results will have further implications and improvements will be seen in the future.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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