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

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Introduction

Poland was initially less affected by the coronavirus disease 2019 (COVID-19) pandemic, however, severe restrictions, and health care restructuration 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 restructuration (including the opening of COVID-19-restricted 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 droplet-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

| Question                                                                 | Yes          | No           |
|--------------------------------------------------------------------------|--------------|--------------|
| Dedicated COVID-19 hospital                                              | 36 (18.56%)  | 158 (81.44%) |
| Directly involved in COVID-19 patients treatment?                        | 20 (8.73%)   | 209 (91.27%) |
| Have you ever directly contacted a COVID-19 patient?                     | 56 (24.45%)  | 173 (75.55%) |
| Do you know anyone who was infected with SARS-COV-2?                     | 130 (56.77%) | 99 (43.23%)  |
| Have you ever been obligatorily quarantined?                            | 27 (11.79%)  | 202 (88.21%) |
| How has the COVID-19 pandemic impacted your everyday clinical practice?  | 176 (76.86%) | 45 (19.65%)  |
| Have you ever directly contacted a COVID-19 patient?                     | 5 (2.18%)    | 23 (10.04%)  |
| How do you assess your risk of SARS-CoV-2 infection?                     | 10 (4.37%)   | 56 (24.45%)  |
| On a scale of 1–5, how do you assess the potential course of COVID-19?   | 54 (23.58%)  | 130 (56.77%) |
| When admitting patients without suspicion of COVID-19, do you wear       | 166 (72.49%) | 88 (38.43%)  |
| Do your main worksite provide sufficient PPE?                           | 46 (20.09%)  | 114 (49.78%) |
| Has the access to PPE improved since the beginning of the pandemic?      | 82 (35.81%)  | 98 (42.79%)  |
| Do you feel there is free and rapid access to rapid genetic testing?     | 69 (30.13%)  | 87 (40.61%)  |
| How many estimated fewer patients do you have on an outpatient basis?   | 9 (4.21%)    | 17 (7.94%)   |
| How do you assess your risk of SARS-CoV-2 infection?                     | 54 (23.58%)  | 54 (23.58%)  |
| During the COVID-19 pandemic, your earnings:                            | 9 (4.21%)    | 17 (7.94%)   |
| How has the COVID-19 pandemic affected your family relations?            | 54 (23.58%)  | 54 (23.58%)  |
| COVID-19 – coronavirus disease 2019; IQR – interquartile range; PPE – personal protective equipment |            |              |
### Table 3. Comparisons of selected groups

|                | Urologists Mean (SD) | Residents Mean (SD) | p-value | Urologists Median (IQR) | Residents Median (IQR) | p-value | p-value | p-value |
|----------------|----------------------|---------------------|---------|-------------------------|------------------------|---------|---------|---------|
| **Age (median, IQR)** | 52 (21)              | 31 (4)              | <.01    | 37 (22)                 | 45 (25)               | .03     | .49     | 1       |
| **Sex (% male)**     | 137 (87.3%)          | 61 (84.7%)          | .68     | 147 (86.5)              | 51 (86.4)             | .05     | .81     | 1       |
| **How has the COVID-19 pandemic impacted your everyday clinical practice?** |                       |                     |         |                         |                        |         |         |         |
| Highly              | 120 (76.4%)          | 56 (77.8%)          |         | 133 (78.2%)             | 43 (72.9%)            |         |         | .61     |
| Moderately          | 32 (20.4%)           | 13 (18.1%)          | .66     | 30 (17.7%)              | 15 (25.4%)            | .61     |         | .66     |
| Little              | 4 (2.6%)             | 1 (1.4%)            |         | 4 (2.4%)                | 1 (1.7%)             | .01     | .61     | .66     |
| Not at all          | 1 (0.6%)             | 2 (2.8%)            |         | 3 (1.8%)                | 0 (0%)                | .01     | .61     | .66     |
| **Does your main worksite provide sufficient PPE?** |                       |                     | .07     | 18 (25%)                | 21 (19.9%)            | .07     |         | <.01    |
| Definitely yes      | 30 (19.1%)           | 16 (22.2%)          |         | 13 (22%)                | 33 (19.4%)            |         |         | .61     |
| Rather yes          | 87 (55.4%)           | 27 (37.5%)          |         | 25 (42.4%)              | 89 (52.4%)            |         |         | .61     |
| Rather no           | 20 (12.7%)           | 17 (23.6%)          |         | 9 (15.3%)               | 28 (16.5%)            |         |         | .61     |
| Definitely no       | 12 (76.6%)           | 9 (12.5%)           |         | 9 (15.3%)               | 12 (7.1%)             | .01     | .61     | .66     |
| Don’t know          | 8 (5.1%)             | 3 (4.2%)            |         | 3 (5.1%)                | 8 (4.7%)             | .25     | .18     | .10     |
| **Have you noticed that your colleagues show an increased level of anxiety, sadness or stress than usual during the pandemic?** |                       |                     | .17     | 67 (38.2%)              | 41 (56.5%)            | .04     |         | .07     |
| Definitely yes      | 49 (31.2%)           | 29 (40.3%)          |         | 13 (22%)                | 65 (38.2%)            |         |         | .61     |
| Rather yes          | 78 (49.7%)           | 27 (37.5%)          |         | 34 (57.6%)              | 71 (41.8%)            |         |         | .61     |
| Rather no           | 29 (18.5%)           | 14 (19.4%)          |         | 11 (18.6%)              | 32 (18.8%)            | .07     | .61     | .66     |
| Definitely no       | 1 (0.6%)             | 2 (2.8%)            |         | 1 (1.2%)                | 2 (1.7%)             | .07     | .61     | .66     |
| **Have you noticed an increased feeling of anxiety, sadness or stress than usual?** |                       |                     | .76     | 17 (27.8%)              | 9 (25%)              |         |         | .33     |
| Definitely yes      | 24 (15.3%)           | 15 (20.8%)          |         | 8 (13.6%)               | 31 (18.2%)            |         |         | .45     |
| Rather yes          | 65 (41.4%)           | 28 (38.9%)          |         | 21 (35.6%)              | 72 (42.4%)            |         |         | .33     |
| Rather no           | 49 (31.2%)           | 22 (30.6%)          |         | 21 (35.6%)              | 50 (29.4%)            | .07     |         | .33     |
| Definitely no       | 19 (12.1%)           | 7 (9.7%)            |         | 9 (15.3%)               | 17 (10%)             | .07     | .61     | .66     |
| **Has the access to PPE improved since the beginning of the pandemic?** |                       |                     | .72     | 22 (61.1%)              | 60 (31.1%)            | .02     |         | .02     |
| Definitely yes      | 58 (36.9%)           | 24 (33.3%)          |         | 26 (44.1%)              | 56 (32.9%)            |         |         | .72     |
| Rather yes          | 65 (41.4%)           | 33 (45.8%)          |         | 24 (40.7%)              | 74 (43.5%)            |         |         | .13     |
| Rather no           | 19 (12.1%)           | 8 (3.8%)            |         | 2 (3.4%)                | 23 (13.5%)            | .02     | .61     | .66     |
| Definitely no       | 4 (2.6%)             | 1 (1.4%)            |         | 2 (3.4%)                | 3 (1.8%)             | .02     | .61     | .66     |
| Don’t know          | 11 (7%)              | 8 (11.1%)           |         | 5 (8.5%)                | 14 (8.2%)            | .02     | .61     | .66     |
| **Do you feel there is free and rapid access to the rapid genetic testing?** |                       |                     | .49     | 17 (28.8%)              | 37 (21.8%)            | <.01    |         | .35     |
| Definitely yes      | 47 (29.9%)           | 22 (30.6%)          |         | 25 (42.4%)              | 44 (25.9%)            | .02     | .61     | .66     |
| Rather yes          | 44 (28%)             | 23 (31.9%)          |         | 20 (33.9%)              | 47 (27.7%)            | .02     | .61     | .66     |
| Rather no           | 30 (19.1%)           | 17 (23.6%)          |         | 10 (17%)                | 37 (21.8%)            | .02     | .61     | .66     |
| Definitely no       | 19 (12.1%)           | 7 (9.7%)            |         | 4 (6.8%)                | 22 (12.9%)            | .02     | .61     | .66     |
| Don’t know          | 17 (10.8%)           | 3 (4.2%)            |         | 0 (0%)                  | 20 (11.8%)            | .02     | .61     | .66     |
| **During the COVID-19 pandemic, your earnings:** |                       |                     | .02     | 23 (31.6%)              | 44 (25.9%)            | <.01    |         | .02     |
| Have not changed or changed <10% |                       |                     |         | 14 (23.7%)              | 28 (16.5%)            |         |         | .02     |
| 11–25% decrease     | 40 (25.5%)           | 14 (19.4%)          |         | 16 (27.1%)              | 38 (22.4%)            | .02     | .61     | .66     |
| 26–50% decrease     | 52 (33.1%)           | 22 (30.6%)          |         | 25 (42.4%)              | 49 (28.8%)            | .02     | .61     | .66     |
| >50% decrease       | 42 (26.8%)           | 12 (16.7%)          |         | 4 (6.8%)                | 50 (29.4%)            | .02     | .61     | .66     |
| >10% increased      | 2 (1.3%)             | 3 (4.2%)            |         | 0 (0%)                  | 5 (2.9%)             | .02     | .61     | .66     |
| **Do you think that the COVID-19 pandemic indirectly affected your family relationships?** |                       |                     | .85     | 36 (22.9%)              | 18 (25%)             | .42     |         | .32     |
| Yes, highly         | 33 (21%)             | 16 (22.2%)          |         | 13 (22%)                | 36 (21.2%)            | .02     | .61     | .66     |
| Yes, moderately     | 48 (30.6%)           | 18 (25%)            |         | 18 (30.5%)              | 48 (28.2%)            | .02     | .61     | .66     |
| Yes, barely         | 40 (25.5%)           | 20 (27.8%)          |         | 11 (18.6%)              | 49 (28.8%)            | .02     | .61     | .66     |
| No                 | 36 (22.9%)           | 18 (25%)            |         | 17 (28.8%)              | 37 (21.8%)            | .02     | .61     | .66     |
During the COVID-19 era, high uptake of telemedicine 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 virus 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 telemedicine has been observed, with 55.90% claiming that their income dropped over 25% declines in outpatient consultations and 86.92% of doctors reporting that their 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.
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-
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 restructuration, 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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