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TELEMEDICINE

Telemedicine in Radiation Oncology Post—COVID-19 Pandemic: There Is No Turning Back

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Purpose: We aimed to assess patients' and physicians' perspectives on wider implementation of telemedicine in radiation oncology practice, disrupted by the novel coronavirus disease 2019 (COVID-19).

Methods: Quantitative questionnaires were prepared and distributed between May 27 and June 11, 2020. A 29-question survey targeting patients with cancer was distributed electronically via cancer support organizations. Cross-sectional data from a selected weekday at a radiation oncology department were also analyzed. In addition, a 25-question survey was distributed to 168 physicians employed by a comprehensive cancer center.

Results: In total, we have analyzed 468 patients' and 101 physicians' responses. Among responding patients, 310 were undergoing active treatment and 158 were in follow-up care. Both patients and physicians reported no experiences with video consultations during the COVID-19 pandemic, but 15% of patients stated that they missed telemedicine services that would include a video call. Overall, 30.6% of patients expressed interest in more frequent usage of telemedicine and 23.3% would start using it. Sixty-seven percent of radiation oncologists expressed interest in more frequent usage of telemedicine, and 14% would use it similarly as in the past. For patients treated with radiation therapy (RT), 59.9% and 63.4% of the responding patients acknowledged that video consultations would be an important addition to medical care during RT course or after the completion of RT, respectively. Comparably, 61.1% and 63.9% of radiation oncologists believed video consultations would be useful or extremely useful for patients undergoing RT or for patients in the follow-up setting, respectively.

Conclusions: The post—COVID-19 era represents a unique chance to improve and guarantee continuity of cancer care via telemedicine solutions, when appropriate. © 2020 Elsevier Inc. All rights reserved.

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The data that support the findings of this study are available on request from the corresponding author, I.R. The data are not publicly available due to their containing information that could compromise the privacy of research participants.

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Introduction

The novel coronavirus disease 2019 (COVID-19) pandemic has changed the landscape of medical practice in the past months due to preventive measures and infection control efforts. In line with social distancing policies, telemedicine re-emerged as an appealing option for remote patient consultations. More specifically, in the field of radiation oncology, several professional societies and leading experts are directly or implicitly advocating the RADS framework (remote visits, avoidance or deferral of radiation, and shortening of radiation), elucidated by Zaorsky et al in the context of prostate cancer care.[1] Whereas a substantial shift toward hypofractionation and remote working in terms of delineation and planning has been reported, less is known about the implementation of telemedicine in radiation therapy (RT) departments as a direct consequence of the COVID-19 pandemic.[2-4]

Institute of Oncology Ljubljana is a tertiary comprehensive cancer center (CCC) that welcomes more than 14,000 patients each year and provides almost 110,000 in-person patient consultations. Since the start of the epidemic, a significant number of nonurgent visits and follow-ups have been rescheduled or partly done by phone or e-mail correspondence. However, video call consultations were not offered but are being now strongly considered for future use. Therefore, we aimed to assess patients' and physicians' perspectives on the potential of remote visits as a consequence of the global COVID-19 situation.

Methods and Materials

Two separate questionnaires were prepared and distributed online to 168 physicians employed by CCC and to national cancer patient associations. The questionnaire for physicians consisted of 25 questions focusing on demographics, area of oncologic expertise, personal experience with telemedicine, and opinions on video call consultations. The patients' 29-question survey included questions on perspectives and acceptability of remote consultations. The online survey was open between May 27 and June 11, 2020. In addition, we selected a weekday to gather cross-sectional data from patients currently undergoing RT at the CCC.

Results of the study are reported based on their frequency distributions. A Likert scale was used to measure respondents' agreement with a variety of statements. The χ^2 test was used for contingency tables analysis; the significance level was set at $P \leq .05$. Statistical analyses were carried out using SPSS Statistics software version 26 (SPSS Inc, IBM corporation, Armonk, NY). Figures were created using Microsoft Excel for Office 365 version 1812 (Microsoft Corporation, Redmond, WA). The study was approved by the institutional review board (decision No. ERID-KSOPKR-0037/2020) and ethics committee (decision No. ERIDEK-0038/2020).

Results

Patients' perspectives

We have received answers from 468 patients (428 completed and 40 partially completed), of whom 310 (66%) were undergoing active treatment at the time of the study; the rest were in follow-up care after completed cancer treatment. More than two-thirds of patients (69.2%) had experience with RT, either at the time of the survey or in the past. Demographic data are presented in Table 1.

Eight percent of respondents reported thinking about skipping an in-person appointment with their oncologist due to the fear of COVID-19 infection. Since the start of the pandemic, 25.5% of participating patients contacted their oncologist by phone and 4.8% via e-mail. Video call consultations were practically nonexistent, even though 15% of patients stated that they would prefer telemedicine services,

Table 1 Responding patients' demographics

Characteristics	Respondents	
(N = 468)	n	%
Age group (y)		
<29	5	1.1
30-49	142	30.7
50-64	188	40.6
65-75	89	19.2
≥76	39	8.4
Sex		
Male	128	27.5
Female	336	72.1
Other/not responding	2	0.4
Education		
Primary	49	10.5
Secondary	243	51.9
Postsecondary	174	37.2
Not responding	2	0.4
Cancer type		
Breast cancer	214	45.7
Head and neck cancer	34	7.3
Lung cancer	27	5.8
Lymphoma	26	5.6
Prostate cancer	25	5.3
All other types	108	23.1
Not responding	34	7.2
Treatment		
Surgery	321	68.6
Radiation therapy	324	69.2
Chemotherapy	242	51.7
Targeted therapy	47	10.0
Hormone therapy	139	29.7
Other treatments	22	4.7
Currently undergoing treatment		
Yes	310	66.2
No	132	28.2
Not responding	52	11.2

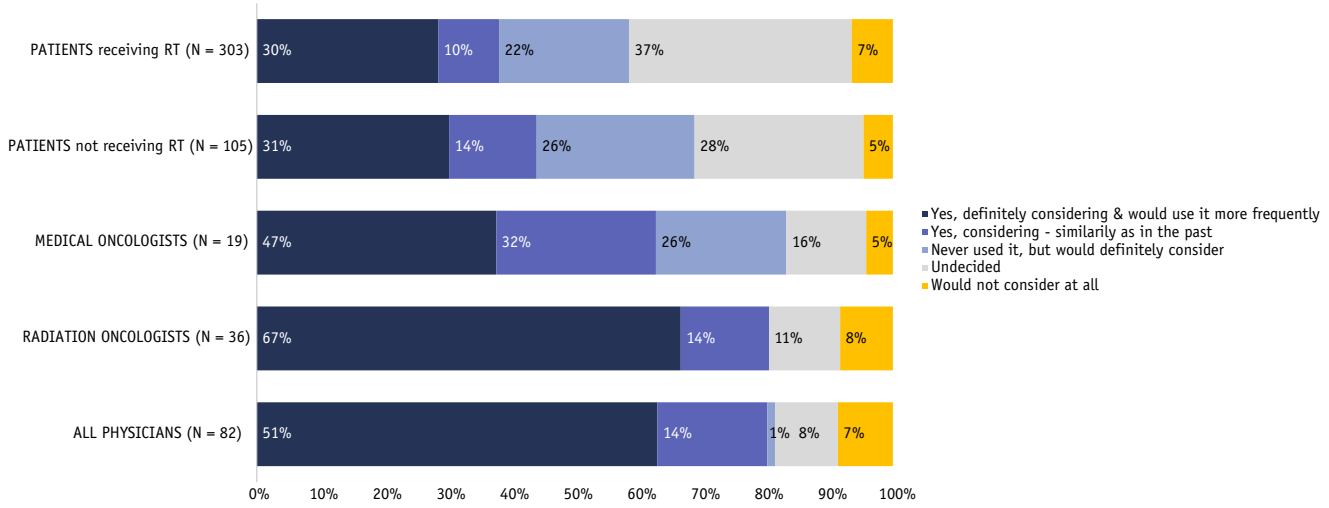

Fig. 1. Expected use of telemedicine in oncology post—COVID-19 pandemic. *Abbreviation:* RT = radiation therapy.

which would include video call as well. Nonetheless, 92.6% of patients who had a phone consultation with their oncologist described their experience as either good or exceptionally good. Regarding the post—COVID-19 era, 30.6% of patients expressed interest in more frequent usage of telemedicine, 23.3% would start using it, and 27.9% of participants were undecided. No differences in interest in future telemedicine use were observed between patients treated with RT or not treated with RT (62.7% vs 74.3%, respectively; $P = .309$) (Fig. 1) or between patients aged $\geq$50 years versus $\leq$49 years (61.5% vs 73.2%, respectively; $P = .161$). For patients who were treated with RT, 59.9% and 63.4% of the responding patients (N = 297) acknowledged that video consultations would be an important addition to medical care during an existent RT course or after the completion of RT treatment, respectively. The level of patient agreement with statements on benefits of telemedicine is presented in Figure 2.

Although 83.1% of patients were using a smartphone or tablet and 75.1% of patients would be willing to report side effects during or after the completion of treatment via apps, the majority (82.9%) would still miss personal contact with their physician and classical clinical examination (89.9%).

Physicians' perspectives

We received 83 completed and 18 partially completed responses from physicians (61.3% response rate), 39% of them accounting for radiation oncologists (ROs). Demographics are given in Table 2. Since the start of the COVID-19 pandemic, 71% of respondents reported contacting their patients by phone and 34% via e-mail. No video calls were made. Interestingly, ROs were more likely to use phone consultations compared with medical oncologists (86.8% vs 78.9%, respectively; $P = .001$) and other

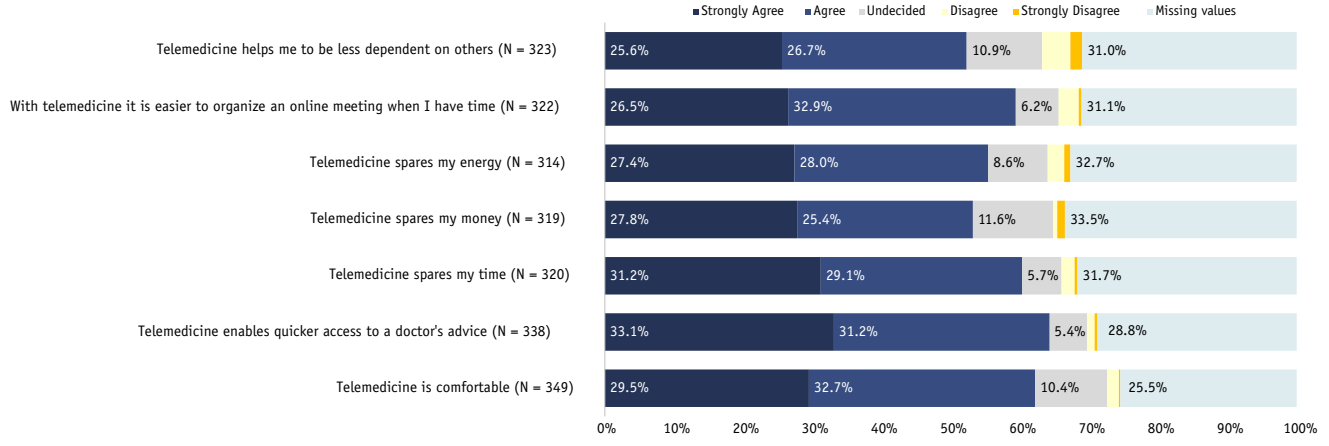

Fig. 2. Statements on telemedicine benefits: patients' agreement (N = 468).

Table 2 Responding physicians' demographics

Characteristics	Respondents n	Respondents %
Age group (y) (N = 101)		
≤49	34	33.7
≥50	67	66.3
Sex (N = 101)		
Male	31	30.7
Female	70	69.3
Subspecialty (N = 97)		
Radiation oncology	39	40.2
Medical oncology	20	20.6
Other*	38	39.2
Years in practice (N = 96)		
≥5	12	12.5
6-10	13	13.5
11-20	18	18.8
>20	31	32.3

* Surgery, radiology, nuclear medicine, pathology, anesthesiology, clinical genetics, neurology, and infectious diseases.

specialties combined (48.6%) and were less likely to use e-mail consultations (39.5% vs 57.9%, respectively; $P = .003$). Sixty-six percent of physicians who used phone consultations had good or particularly good experience with patient communication, and none reported an particularly bad experience.

ROs were also asked to assess the potential usefulness of video call consultations for patients during the course of radiation and for patients on follow-up after completion of RT. Only 19.4% answered that video calls would not to be useful during RT, and 16.7% thought the same for follow-up care. Contrary to that, 61.1% believed that video calls would be useful or extremely useful already during RT and 63.9% for a follow-up setting. The percentage of those who believed video calls could be extremely useful was slightly higher in favor of follow-up care (16.7%) compared with check-ups during the course of radiation (11.1%).

The degree of physicians' agreement with provided statements on the benefits of telemedicine is presented in Figure 3. The difference in expected use of telemedicine in the near future between patients and oncologists is depicted in Figure 1.

Discussion

With this survey, we have assessed patients' and physicians' perspectives on wider implementation of telemedicine in oncology practice. Our data suggest that telemedicine, especially when it includes video call consultation, can be an acceptable option for a significant fraction of patients with cancer and for those undergoing RT. Because the questionnaire was disseminated to all physicians employed at the CCC, it was possible to compare perspectives from ROs and medical oncologists. ROs were more inclined toward frequent future use of telemedicine if available, which can be partly explained by ROs being more used to working with newer technologies.

Even though a review of small studies had already found video calls in oncology to be feasible and effective,[5] telemedicine in oncology has so far mainly facilitated care for individuals in remote areas and those who are incarcerated.[6,7] However, infection control as a stimulus for telehealth emerged even before the current pandemic.[8] This is the first time that the need for remote visits was suddenly raised on such a large scale. Results of the American Society for Radiation Oncology's survey on the impact of

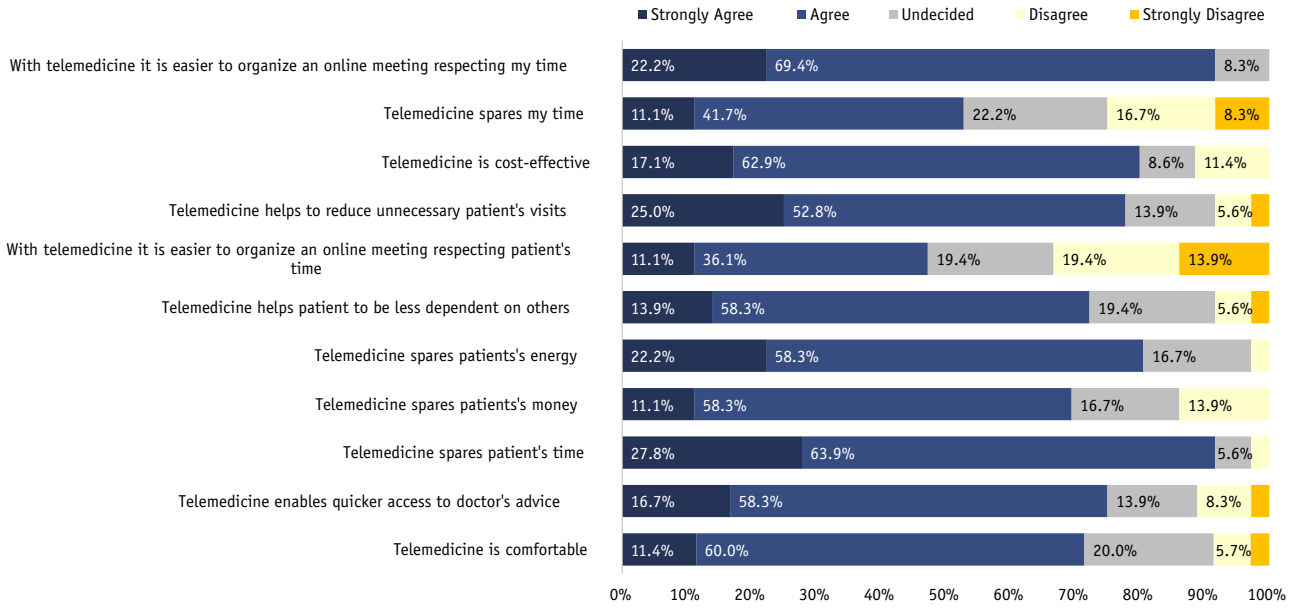

Fig. 3. Statements on telemedicine benefits: radiation oncologists' agreement (N = 36).

COVID-19 are noteworthy; already 89% of responding centers now offer telemedicine consultations.[9] Notably, reimbursement challenges will need to be solved,[10] which is also true for our center, where we have initiated the process of appropriate recognition of telemedicine services by the health care and reimbursement authorities.

Conclusions

We believe that the consequences of COVID-19 will continue to influence organizational aspects of cancer care. Results of this simple study support our efforts to partially reorganize cancer care in the future and implement telemedicine consultations, whenever feasible.

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