

RESEARCH ARTICLE

Oncology provider experiences during the COVID-19 pandemic

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Abstract

Purpose

The COVID-19 pandemic upended nearly all aspects of daily life and of medical care, placing a double burden of professional and personal concerns on those who provide medical care. We set out to assess the burden of the pandemic on provider outlook and understand how cancer survivorship providers experienced rapid changes to practice.

Methods

We distributed a survey through the American College of Surgeons Commission on Cancer (CoC) to its accredited organizations in mid-October 2020. We included questions on provider characteristics, changes in patient care practices resulting from the pandemic, worry about COVID-19, and concern about impact on cancer survivors.

Results

Of the n = 607 participants, three-quarters were female and three-quarters were White. Only 2.1% of participants reported having had COVID-19, but 43% reported anxiety about getting COVID-19 and over a quarter experienced sadness or depression, anxiety about the future, changes to sleep, difficulty concentrating, or social isolation. Approximately half of providers also expressed significant concern about progression of cancer in patients who experienced care delays or were afraid of accessing in-person care. In terms of changes to survivorship care, respondents reported changes to visitor policies, delays or cancellations, and efforts to reduce in-person visits.

Conclusions

COVID-19 has taken a significant toll on front-line healthcare professionals, including oncologists and cancer care allied health professionals. Findings support proactive mental health

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support of healthcare professionals as well as emergency preparedness to manage delays to care for cancer patients in the event of future unexpected pandemics.

Introduction

The COVID-19 pandemic upended nearly all aspects of daily life, including medical care for cancer survivors. Immediate and widely implemented changes included rapid shifts to telehealth, delays in screenings and treatment, and changes in visitor policies [1, 2]. Rapid publications, including from professional societies, detailed how to adapt oncology care, with recommendations for change in delivery of those services that could be delivered remotely, as well as services that were not time sensitive (e.g. delaying adjuvant therapy), vs those that should not be delayed (e.g. curative treatment for solid tumors) [1, 3–8]. Editorials outlined opportunities for telemedicine in future oncology care, as well as how to resume and improve cancer survivorship care to address needs unmet during the pandemic [3, 9, 10].

However, there are few studies published on cancer care provider experiences during the pandemic. Of the relevant publications, two focused on providers for childhood cancer patients [11, 12], another focused on breast cancer physicians only [13], while another study focused on caring specifically for older adults with cancer [14]. Our study builds on this emerging body of literature to describe experiences of a nationwide sample of oncology providers (physicians, PAs, nurses, social workers, etc.) caring for adult-onset cancer survivors, including delays to care and the extensive personal toll of providing care during the pandemic. Ours is the first known study to examine provider perspectives on care during the COVID-19 pandemic focused on the post-treatment cancer survivorship phase.

Methods

Survey development

The Cancer Care Provider Experiences with COVID-19 Survey was developed by the authors (HA and MPC) through a mix of consensus-based, adapted and validated measures (S1 Table). Two screening questions verified eligibility (i.e., active provider of cancer survivorship care and practice within the U.S.). The 43-item survey included 11 demographic questions and skip-logic for outcome variables to reduce length of the survey for respondents based on individual experiences. Questions asked about provider characteristics, changes in patient care practices resulting from the pandemic, worry about COVID-19 including mental health concerns (adapted from National Institutes of Health PhenX toolkit on COVID-19 questionnaire [15]), and concerns about the impact of COVID-19 on patient outcomes.

Recruitment

The survey was distributed through the American College of Surgeons Commission on Cancer (CoC) to its accredited organizations. The CoC sent the survey to the cancer registrar and physician liaison on record at each cancer center and asked the registrar to forward the survey to the survivorship coordinator. Using the Dillman method, the survey was disseminated via email three times from October 13 to October 27, 2020, one week apart [16, 17]. Each email included a direct link to the survey in the Research Electronic Data Capture (REDCap) system. Study data were collected and managed using REDCap electronic data capture tools hosted at Children's National [18]. REDCap is a secure, web-based application designed to support data

capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources.

Study population

There were 966 observations in the provider data. First, we eliminated $n = 145$ who did not report practicing in the US, and second, we eliminated $n = 13$ who did not report providing care for post-treatment cancer survivors specifically. We then eliminated individuals who had large amounts of missing data, which we defined as those who answered no questions (i.e. opened the survey but did not complete any fields, or those who completed only the first question, but no further questions out of the 11 questions that were focused on changes due to the pandemic), which left us with a final dataset of $N = 607$.

Statistical analyses

We used descriptive statistics (means, percentages) to describe responses among our sample population. SAS V9.4 (Cary, NC) was used in all analyses.

The study received IRB exemption from the George Washington University (NCR202819). All participants had to acknowledge reviewing and agreeing to the informed consent presented on the survey landing page in REDCap via a checkbox before proceeding with the survey. Funding for the study was provided by the Patient Centered Outcomes Research Institute (PCORI EADI-12744).

Results

Respondent characteristics are described in [Table 1](#). Of the $N = 607$ respondents, 24.1% self-reported male and 59.3% self-reported female gender. Most respondents were non-Hispanic White (75.6%). Respondents were relatively evenly distributed by urban/suburban status, with 39.9% reporting urban locations, 35.8% reporting suburban locations, with a lower percentage (18.0%) reporting rural locations. Providers came from varied perspectives, including medical oncology (8.6%), surgical oncology (13.5%), radiation oncology (4.1%), nursing (25.5%), nurse practitioner/physician's assistant (NP/PA) (19.4%), social work (6.1%), and patient navigation (13.3%). Most respondents were associated with a COC-accredited organization (78.8%), while some reported association with a community hospital (44.2%) and some with an academic or teaching hospital (18.3%) (not mutually exclusive).

Providers reported a number of personal concerns during the pandemic ([Table 2](#)). The most common concerns were anxiety about getting COVID-19 (42.8%; range 50.3% for physicians to 36.6% for NP/PAs), infecting others (43.0%), and concern about a family member or close friend getting or dying of COVID-19 (53.1%). Still, most providers also reported hopefulness that the pandemic would end soon (53.2%). Notably, only 34.3% (range 43.6% for physicians to 26.6% for nurses) reported believing that there will be a vaccine or cure for COVID soon, although FDA approval for the Pfizer-BioNTech COVID-19 vaccine would prove to be a little more than a month away from the time of survey completion. Approximately a quarter to a third of providers reported feelings of sadness or depression, negativity or anxiety about the future, changes to sleep, changes in eating habits or weight, concentration issues, and social isolation. Still 57% reported engaging in mindfulness activities and/or a hobby that brought joy to their life (range 59.8% for physicians to 50.9% for NP/PAs).

When asked about long-term concerns of the pandemic ([Table 3](#)), 14.2% of providers were very worried and 49.3% of provider were somewhat worried (range 19.8% of physicians vs

Table 1. Characteristics of survey participants (N = 607)^a.

Provider sex assigned at birth	
Male	113 (18.6)
Female	447 (73.6)
Prefer not to answer	8 (1.3)
Missing	39 (6.4)
Gender	
Cisgender Male	150 (24.1)
Cisgender Female	360 (59.3)
Other	5 (0.9)
Prefer not to answer	28 (4.6)
Do not understand the question	25 (4.1)
Missing	39 (6.4)
Sexual Orientation	
Lesbian, Gay, Homosexual, Bisexual, Pansexual	11 (1.8)
Straight	524 (86.3)
Prefer not to answer	32 (5.3)
Do not understand the question	3 (0.5)
Missing	37 (6.1)
Race/ethnicity	
Asian	36 (5.9)
Black	15 (2.5)
Hispanic/Latinx	38 (6.3)
White	459 (75.6)
Other	12 (2.0)
I prefer not to answer	22 (3.6)
Missing	25 (4.1)
Urbanicity	
Urban (city)	242 (39.9)
Suburban (outside a city)	217 (35.8)
Rural (not near a city)	109 (18.0)
Missing	39 (6.4)
Location	
State	551 (90.8)
Tribe/Territory	15 (2.5)
Missing	41 (6.7)
Role	
Oncologist	159 (26.2)
Other physician	22 (3.6)
Nurse practitioner/ Physician assistant	118 (19.4)
Nurse	155 (25.5)
Clinical Researcher	7 (1.2)
Social Worker	37 (6.1)
Patient Navigator	81 (13.3)
Missing	28 (4.6)
Organization^a	
CoC-accredited	478 (78.8)
NCI-designated	50 (8.2)
Academic/Teaching hospital	111 (18.3)

(Continued)

Table 1. (Continued)

Community hospital	268 (44.2)
Free-standing oncology practice	46 (7.6)
Free-standing multi-specialty group	17 (2.8)
Other cancer practice	20 (3.3)

^aParticipants can select more than one category.

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10.6% of nurses), while 31.3% were not worried about the healthcare system handling backlogged patients (range 38.5% of nurse vs 29.3% of NP/PAs). A greater percentage were very (46.8%; range 60% of other providers vs 52.9% of nurses) or somewhat (38.7%) worried about progression of cancer in patients who experienced care delays; these numbers were similar to worry about progression of cancer in patients afraid of accessing care.

Providers reported significant changes in patient care during the pandemic (Table 4). Nearly all reported changes to visitor policies (93.6%), while many reported delays in follow up for patients in treatment (64.6%) or survivorship care (66.4%). Approximately half reported changes to treatment selection to reduce in-person visits (47.0%) and reported triage based on professional society guidelines (e.g. NCCN, ACOS, ASCO) to determine when in-person visits were needed (53.2%). One quarter of respondents reported suspension of non-urgent clinical trials (26.4%) and a third reported team-based staff schedules to avoid potential cross-team COVID-19 exposures (33.1%).

Table 2. Personal concerns during the pandemic, overall and by provider role^a.

	Overall	Physician	NP/PA	Nurse	Other ^b
Anxiety/Worry related to COVID-19 (scale 0–11), mean, sd	3.4 (2.7)	3.5 (2.7)	3.2 (2.9)	3.7 (2.7)	3.5 (2.7)
	N (%)				
I feel anxious about getting COVID-19	260 (42.8)	90 (50.3)	41 (36.6)	47 (43.1)	53 (46.1)
I have been diagnosed with COVID-19	13 (2.1)	8 (4.5)	3 (2.7)	2 (1.8)	0 (0)
I worry about the possibility of infecting others	261 (43.0)	84 (46.9)	45 (40.2)	57 (52.3)	46 (40.0)
I am concerned about a family member or close friend getting or dying from COVID-19	322 (53.1)	103 (57.5)	51 (45.5)	66 (60.6)	55 (47.8)
A family member or close friend has died from COVID-19	53 (8.7)	14 (7.8)	9 (8.0)	10 (9.2)	10 (8.7)
I worry about the possibility of dying from COVID-19	90 (14.8)	32 (17.9)	14 (12.5)	13 (11.9)	17 (14.8)
I feel I have no control over how COVID-19 will impact my life	130 (21.4)	30 (16.8)	28 (25.0)	21 (19.3)	33 (28.7)
I believe there will be a vaccine or cure for COVID-19 soon	208 (34.3)	78 (43.6)	34 (30.4)	29 (26.6)	33 (28.7)
I am hopeful that the COVID-19 pandemic will end soon	323 (53.2)	85 (47.5)	60 (53.6)	53 (48.6)	66 (57.4)
None of these apply to me	33 (5.4)	8 (4.5)	7 (6.3)	6 (6.4)	6 (5.2)
I have experienced feelings of sadness or depression	167 (27.5)	48 (26.8)	28 (25.0)	37 (33.9)	30 (26.1)
I feel negative and/or anxious about the future	189 (31.1)	58 (32.4)	38 (33.9)	29 (26.6)	39 (33.9)
I have experienced changes in my sleep	170 (28.0)	52 (29.1)	27 (24.1)	34 (31.2)	31 (27.0)
I have experienced changes in my eating and/or weight changes	140 (23.1)	39 (21.8)	29 (25.9)	28 (25.7)	28 (24.4)
I have experienced difficulty concentrating	154 (25.4)	38 (21.2)	25 (22.3)	35 (32.1)	35 (30.4)
I have experienced feelings of social isolation or loneliness	182 (30.0)	61 (34.1)	27 (24.1)	32 (29.4)	33 (28.7)
I am hopeful about the future	336 (55.4)	106 (59.2)	62 (55.4)	60 (55.1)	59 (51.3)
I make an effort to engage in mindfulness activities like meditation and/or yoga	237 (39.0)	70 (39.1)	44 (39.3)	37 (33.9)	51 (44.4)
I have a hobby that brings joy to my life	346 (57.0)	107 (59.8)	57 (50.9)	63 (57.8)	67 (58.3)
None of these apply to me	35 (5.8)	8 (4.5)	9 (8.0)	7 (6.4)	6 (5.2)

^aParticipants were instructed to check all that apply

^bOther: Clinical researcher, social worker, patient navigator.

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Table 3. Long-term effects of the pandemic [to be published online only].

How concerned are you about the following issues after physical distancing protocols are lifted?					
	Overall	Physician	NP/PA	Nurse	Other
Inability for system to handle backlogged patient needs					
<i>Very</i>	86 (14.2)	34 (19.8)	17 (16.0)	11 (10.6)	13 (12.0)
<i>Somewhat</i>	299 (49.3)	81 (47.1)	58 (54.7)	53 (51.0)	61 (56.5)
<i>Not</i>	190 (31.3)	57 (33.1)	31 (29.3)	40 (38.5)	34 (31.5)
Progression of cancer in patients who experienced care delays					
<i>Very</i>	284 (46.8)	72 (42.1)	54 (50.9)	51 (48.6)	56 (51.9)
<i>Somewhat</i>	235 (38.7)	83 (48.5)	40 (37.7)	46 (43.8)	39 (36.1)
<i>Not</i>	55 (9.1)	16 (9.4)	12 (11.3)	8 (7.6)	13 (12.0)
Progression of cancer in patients afraid of accessing in-person care					
<i>Very</i>	324 (53.4)	92 (53.5)	63 (58.9)	55 (52.9)	63 (60.0)
<i>Somewhat</i>	220 (36.2)	70 (40.7)	39 (36.5)	48 (46.2)	36 (34.3)
<i>Not</i>	29 (4.8)	10 (5.8)	5 (4.7)	1 (1.0)	6 (5.7)

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Discussion

We found that the COVID-19 pandemic affected cancer survivorship care practice and provider emotional and practical experiences. We identified ongoing concerns as states remain under restrictions and as the U.S. begins to emerge from the pandemic. In terms of practice changes, similar to our findings, other studies have also reported delays to cancer treatment for older adults [14, 19] and appointments for cardio-oncology [20], as well as for treatment of hematological malignancies in one middle-income country [21].

Our study further supports a growing compilation of findings on the personal and professional toll of the pandemic on a broad spectrum of oncology providers. Even prior to the pandemic there were concerns about burnout among oncology health professionals [22–26]. There have further been a number of opinion papers about the impact of COVID-19 on mental health [27, 28], and particularly the burden and stresses placed on healthcare providers, including oncologists [13, 29–34]. An early study out of China suggested symptoms of depression, anxiety, insomnia and distress in health care workers exposed to COVID-19 in March of 2020 [35]. In addition, a study of radiation oncologists in India [36] and of medical oncologists in Canada [37] corroborate our findings that providers worried more about exposing loved

Table 4. Reported practice changes due to COVID, overall and as reported by provider role^a.

	Overall	Physician	NP/PA	Nurse	Other
	n (%)	n (%)	n (%)	n (%)	n (%)
Follow up for patients in treatment delayed or cancelled	392 (64.6)	129 (72.1)	68 (60.7)	69 (63.3)	70 (60.9)
Post-treatment survivorship care canceled or delayed	403 (66.4)	117 (65.4)	84 (75.0)	65 (59.6)	77 (67.0)
Remote work for non-clinical staff	451 (74.3)	137 (76.5)	74 (66.1)	83 (76.2)	74 (80.4)
Triage based on specialty guidelines (e.g. NCCN, ACOS, ASCO) to ensure clinical need for in-person visits	323 (53.2)	117 (65.4)	66 (58.9)	49 (45.0)	45 (39.1)
Changes to treatment selection to reduce in-person visits	285 (47.0)	114 (63.7)	42 (37.5)	35 (32.1)	49 (42.6)
Team-based staff schedules to avoid potential cross-team exposure to COVID-19	201 (33.1)	71 (40.0)	36 (32.1)	27 (24.8)	35 (30.4)
Suspension of nonurgent clinical trials	160 (26.4)	68 (38.0)	27 (24.1)	20 (18.4)	17 (14.8)
Changes to visitor policies (e.g. restricting appointment companions)	568 (93.6)	167 (93.3)	101 (90.2)	106 (97.3)	112 (97.4)
Other	46 (7.6)	8 (4.5)	7 (6.3)	8 (7.3)	9 (7.8)

^aParticipants were instructed to check all that apply.

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ones to COVID-19 than they did about their own personal exposure to COVID. A New Jersey-based study of childhood oncology providers and staff also reported high burnout, but also the significance of pre-pandemic burnout [12]. Interestingly, this study reported that 87% of participants reported that mental health resources were available but only 8.4% had utilized them [12]. Our study indicated less personal concern of contracting COVID than a study conducted in Canada in the early phase of the pandemic (April 2020), but similar rates of reported COVID-19 acquisition. In our study over a quarter of respondents experienced mental health concerns similar to those reported by providers during other infectious disease outbreaks (e.g. severe acute respiratory syndrome- SARS) such as sadness or depression, negativity or anxiety about the future, difficulty concentrating, and social isolation [38]. Given that even prior to the pandemic, physicians were subject to greater burnout relative to the general population, supporting health care provider work-life balance is a critical need [39]. Recent publications highlight strategies for implementing institutional well-being programs during the COVID-19 pandemic and in the future [40], but implementation research is needed to better determine how to introduce these strategies and how they might reach the whole oncology team [33]. Our study also demonstrated differences in perceived worry or anxiety by provider role. Further studies are needed to understand the longer-term impact of these mental health concerns and to implement programs to support providers with lingering mental health impacts from this pandemic or to prepare to support providers through future pandemics, accounting for how different roles may be differently impacted.

A recently published consensus piece focused on cancer surgery from the Internal Cancer Benchmarking Partnership warned of pending needs and heightened caseloads due to COVID-related delays, specifically recommending prompt screening procedures and timely surgeries as needed, reducing diagnosis to treatment intervals [3]. In our survey, similarly, an overwhelming majority of providers were concerned about progression of cancer in patients who experienced care delays and those afraid of accessing in-person care.

Strengths of our study include the large nationwide sample of a diverse group of cancer care providers (e.g. oncologists, NPs, patient navigators), and data captured approximately 6 months into the COVID-19 worldwide pandemic. Limitations of our study include the single time point of assessment, as well as the need to adapt validated scales given limitations in the existing scales to measure the impact of the pandemic on cancer provider experiences.

Conclusion

Our survey results confirm findings that provider burnout and burden are ongoing concerns in the health profession, including oncologists and cancer care allied health professionals, and that the COVID-19 pandemic placed an additional burden on these individuals. This study is among the first to report changes to practice and mental health concerns resulting from COVID-19 among a national sample of oncology care providers and the first to report on the experiences of cancer survivorship care practitioners, specifically. Findings support proactive mental health support of healthcare professionals who are on the front line of pandemic responses as well as emergency preparedness to manage delays to care for cancer patients in the event of future unexpected pandemics.

Supporting information

S1 Table. Provider survey.
(PDF)

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