



# Survey of cancer screening practices and telehealth services among primary care physicians during the COVID-19 pandemic

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## ARTICLE INFO

### Keywords:

Telemedicine  
Covid-19  
Cancer screening  
Cancer prevention

## ABSTRACT

The COVID-19 pandemic resulted in rapid implementation of telehealth within primary care impacting cancer screening. We sought to assess the impact of increased telehealth use on physician recommendation for cancer screenings during the COVID-19 pandemic in North America. Primary care physicians ( $n = 757$ ) were surveyed in Fall 2020 through the Council of Academic Family Medicine's Educational Research Alliance (CERA) general membership survey. Respondents were asked about cancer screening practices and telehealth services during the COVID-19 pandemic. Chi-squared tests were performed to assess relationships between cancer screening practices and changes in care necessitated by the shift to telehealth services. Associations between participant responses and those reporting a diminished patient-provider relationship were assessed with multivariable logistic regression. A substantial proportion of respondents reported postponing screening for breast (34.5%), colon (32.9%), and cervical cancer (31%), and a majority (51.1%) agreed changes in care seeking will lead to increased incidence of late stage cancer. Physicians reported high use of telehealth during the pandemic, but endorsed limitations in its use to maintain cancer screening practices and the patient-provider relationship. Physicians who reported patients were afraid to come into the office were more likely to report an impaired patient-provider relationship (OR = 2.77, 95% CI: 1.33 – 7.87). Physicians who reported that telehealth maintains their patient-provider relationship were less likely to report an impaired patient-provider relationship (OR = 0.33, 95% CI: 0.17 – 0.67). As telehealth becomes increasingly prominent, evaluation of the impact of telehealth on cancer screening and patient-provider relationships will be increasingly important for primary care.

## 1. Introduction

The COVID-19 pandemic resulted in the rapid implementation of telehealth within primary care to allow continued access to care while reducing public health risks (Kichloo et al., 2020). During this time, there was a 683% increase in telehealth visits in a large New York Health system and a 63-fold increase in telehealth visits within the Medicare population compared with previous years (Mann et al., 2020; CMS, 2021).

This telehealth expansion included primary care where many primary care visits previously conducted in clinic were transitioned to telehealth during COVID-19 to decrease the public health risk. Cancer screenings are routinely discussed at the time of a primary care visits although the location of testing may vary with the potential for on-site as with cervical cancer screening or referral for at home and off-site testing

depending on the screening test discussed (Gorin et al., 2021). Telehealth has allowed for increased access to care during COVID-19 and has the potential to increase access to rural areas (Cancino et al., 2020).

Beyond the ability of telehealth to provide access to care, studies have evaluated the quality of care provided by telehealth and patient satisfaction with the care provided. Studies conducted in the United States both prior to and following COVID-19 evaluating adherence to evidence-based guidelines, blood pressure and Hemoglobin A1c, frequency of return visits, hospitalizations, and patient report experience have demonstrated non-inferior care for telemedicine as compared with in person care (Flodgren et al., 2015; Smith et al., 2021; Lu et al., 2021; Zhang et al., 2021; Halpren-Ruder et al., 2019). Patient reported satisfaction for telehealth services was high during COVID-19, however, patient satisfaction was higher for in person visits during this time based on studies conducted in New York City (Ramaswamy et al., 2020).

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<https://doi.org/10.1016/j.pmedr.2022.101769>

Received 7 October 2021; Received in revised form 22 February 2022; Accepted 13 March 2022

Available online 17 March 2022

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Specifically within the scope of cancer screening, previous studies have had limited evaluation of use of telehealth for cancer screening. Studies that have been conducted have evaluated the use of teleconsultation for colorectal cancer screening in Spain with pilot data supporting patient satisfaction with televisits and the use of teledermatology with mixed results at this time and ongoing investigation (Cerezo-Ruiz and Parras-Mejias, 2016; Chuchu et al., 2018).

Due to public health risk during COVID-19, there were delays in care for chronic medical conditions and for cancer screenings (Mann et al., 2020). Half of adults in a United States based study reported that they or their household members delayed medical care during the pandemic for non-COVID related conditions (Findling et al., 2020). During April 2020 compared with the prior year, there were significant reductions in breast (85%), colon (75%), lung (74%), and prostate (56%) cancer screening. By July 2020, these reductions were less pronounced but still present (Patt et al., 2020). These delays in diagnosis and treatment of cancer are projected to result in increased cancer associated morbidity and mortality (Maringe et al., 2020; Yong et al., 2021). Although cancer screening delays have been documented, physician perspective on the use of telehealth for cancer screening and recommendations for cancer screening during the pandemic has not previously been evaluated.

During the pandemic, health disparities with regard to susceptibility and disease severity for COVID-19 infections have been found in racial and ethnic minority populations (Hamidian Jahromi and Hamidianjahromi, 2020; Lopez et al., 2021). Maintaining cancer screening practices in racial and ethnic minority populations is especially important due to disparities in cancer mortality in particular for colorectal and cervical cancer screening (O'Keefe et al., 2015; Krumholz, 2017). It is important to consider the potential impact transition to telehealth visits may have on cancer screening disparities. In one cross-sectional study, telehealth services and video-based telehealth were less likely to be used by Black patients during the start of the COVID-19 pandemic (Pierce and Stevermer, 2020). As a result, we sought to survey physicians on health care seeking during the pandemic between minority and non-Hispanic white patients. COVID-19 resulted in changes in the delivery of health care including the use of telehealth and additional public health measures. In this paper, we surveyed primary care physicians to evaluate the impact of COVID-19 and telehealth on recommended age-appropriate cancer screening practices.

## 2. Materials and methods

### 2.1. Survey methods

Practicing clinicians were surveyed regarding cancer screening during the COVID-19 pandemic and implementation of telehealth. Data were gathered and analyzed as part of the 2020 Council of Academic Family Medicine's (CAFM) Educational Research Alliance (CERA) survey of Family Medicine educators and practicing physicians. CAFM is a joint initiative of four major academic family medicine organizations: Society of Teachers of Family Medicine, North American Primary Care Research Group, Association of Departments of Family Medicine, and Association of Family Medicine Residency Directors. The survey is conducted annually and composed of a demographic section and sections including cancer screening during COVID-19 selected from submitted proposals from CAFM members. The CERA steering committee is composed of 13 members experienced in survey development and administration who review applications (Seehusen et al., 2018). Proposals selected for inclusion are assigned a CERA Research Mentor to refine questions. The authors worked with the survey director and the CERA steering committee to evaluate survey questions for consistency with the overall project aim and readability (Seehusen et al., 2018). Pretesting, conducted with practicing physicians who were not included in the sampling frame, evaluated questions for flow, timing, and readability. Minor changes were made following pretesting for this survey limited to removal of one multiple choice answer selection. The study

was approved by the American Academy of Family Physicians Institutional Review Board in November 2020. The study was exempt from institutional internal review board approval.

Inclusion criteria included practicing physicians in one of the CAFM organizations. Exclusion criteria included program directors, clerkship directors, and department chairs based on CERA surveying protocols to improve response rates to surveys focused on different membership groups. Invitations to participate in the study included a personalized greeting and a letter signed by the presidents of each of the four sponsoring organizations with a link to the survey, which was conducted through the online program SurveyMonkey. Non-respondents received four requests, the final request at two days before closing the survey, to complete the survey via SurveyMonkey. The survey was distributed to 4,582 candidates. Of these, 177 were returned as undeliverable email addresses and 58 were excluded who had previously opted out of receiving surveys from Survey Monkey. Additionally, 64 respondents did not meet the qualifying questions and are excluded from further survey questions. The survey was delivered to a final sample of 4,283 family medicine physicians (4,133 U.S. and 215 Canada) between November 20, 2020, and December 15, 2020. Of those surveys that were delivered, there were 867 response (20.2% response rate) with 757 reported providing active patient care in the past 12 months. These 757 responses formed the sample to be included in the analysis.

### 2.2. Screening practices

Participants completed survey questions on demographic information and on cancer screening practices. Demographic information included age, gender, race/ethnicity, practice setting, community setting, and telehealth usage. Cancer screening questions included a combination of multiple-choice questions and Likert style questions. Questions asked about cancer screening practices during COVID-19. Questions focused on how the pandemic affected changes in provider screening practices for breast, colon, and cervical cancer. Specific questions are listed in Table 2.

### 2.3. Attitudes toward delivery of care during the pandemic

Participants were surveyed on their perspective on care delivery during COVID-19. Questions focused on opinions of telehealth and how it affected the patient-provider relationship. The questions also addressed perceived changes in care seeking behavior. Specific questions are listed in Table 3.

### 2.4. Statistical analysis

Descriptive statistics were calculated for all variables. Individuals were included in sample size if they answered any of the survey questions. Group means and standard deviations are presented for continuous variable. Counts and percentages are presented for categorical values. Comparisons between groups were assessed using chi-squared tests. Logistic regression models were fit to assess whether physician and practice factors impacting the physician-patient relationship and differences in care seeking. Regression models examined associations between these outcomes and a variety of variables available in the data set. Regression models on the physician-patient relationship were adjusted for respondent age, race, ethnicity, gender, patient internet access, and time spent on research tasks. Regression models on differences in care seeking were adjusted for respondent age, race, ethnicity, gender, and patient internet access. Time spent on research tasks was included as it competed with time spent providing patient care. A  $p$ -value  $<0.05$  was considered statistically significant. IVM SPSS v25 and Rv4.0.3 was used for statistical analyses.

**Table 1**  
Demographic information on survey respondents.

| n = 757   | Average (stdev) |
|---|-----------------|
| <b>Age</b>  | 47.9 (11.2)     |
| <b>Gender</b>   | % (n)           |
| Female  | 61.0 (462)      |
| Male  | 36.9 (279)      |
| Other   | 0.4 (3)         |
| Choose not to Disclose  | 0.9 (7)         |
| <b>Ethnicity</b>  |                 |
| Hispanic/Latino   | 5.0 (38)        |
| Non-Hispanic/Latino   | 93.5 (708)      |
| <b>Race</b>   |                 |
| American Indian or Alaska Native                                | 0.4 (3)         |
| Asian   | 7.6 (58)        |
| Black or African-American                                       | 3.4 (26)        |
| Native Hawaiian or Pacific Islander                             | 0.3 (2)         |
| White   | 83.8 (634)      |
| Choose not to Disclose  | 4.1 (31)        |
| <b>Community Size</b>   |                 |
| Less than 30,000  | 5.5 (42)        |
| 30,000 to 75,000  | 11.4 (86)       |
| 75,001 to 150,000   | 17.2 (130)      |
| 150,001 to 500,000  | 26.9 (204)      |
| 500,001 to 1 million  | 13.7 (104)      |
| More than 1 million   | 24.8 (188)      |
| <b>Primary visit type</b>                                       |                 |
| Telehealth visits   | 15 (114)        |
| In clinic visit   | 46.8 (355)      |
| 50:50 telehealth and in clinic visits                           | 37.2 (282)      |
| <b>Telehealth visit type</b>                                    |                 |
| I am not using telehealth                                       | 4.6 (35)        |
| I provide telehealth via telephone or other voice only platform | 18.0 (136)      |
| I provide telehealth visits with audio and video                | 77.4 (586)      |
| <b>Percent of patients with video capability</b>                |                 |
| 0–25%   | 17.3 (131)      |
| 26–50%  | 22.3 (169)      |
| 51–75%  | 27.7 (210)      |
| 76–100%   | 10.2 (77)       |

**Table 2**  
Impact of COVID-19 on cancer screening practices.

|  | Breast %<br>(n)<br>(710) | Colon %<br>(n)<br>(714) | Cervical %<br>(n)<br>(715) |
|--|--------------------------|-------------------------|----------------------------|
| Delaying screening until there is reduced public health risk                                 | 9.0 (68)                 | 9.5 (72)                | 8.6 (65)                   |
| I had previously been postponing screening but have now resumed my usual screening practices | 34.5 (261)               | 32.9 (249)              | 31.0 (235)                 |
| Initiating screening at a later age  | 0                        | 0                       | 0.26 (2)                   |
| Recommending screening at a longer time interval   | 1.6 (12)                 | 1.2 (9)                 | 0.9 (7)                    |
| Recommending changes in screening only for individuals at high risk                          | 3.2 (24)                 | 3.4 (26)                | 2.4 (18)                   |
| I have not changed my screening recommendations  | 45.6 (345)               | 47.3 (358)              | 51.3 (388)                 |

### 3. Results

#### 3.1. Demographics

The overall response rate for the survey was 20.2% (862/4283) consistent with previous CERA general membership surveys (Rouse et al., 2016; Mainous et al., 2015). Demographic information collected on survey respondents included age, gender, ethnicity, race, community size, and telehealth use. The average age of respondents was 47.9 ± 11.2 years. The majority of respondents were non-Hispanic white and female. Practicing physicians had mixed visit types including primarily telehealth visits (15%, n = 114), primarily in clinic visits (46.8%, n = 355), and 50:50 telehealth and in clinic visits (37.2%, n = 282) however 95.4% were using telehealth services in some capacity. Telehealth visits

**Table 3**  
Attitudes toward delivery of care during the pandemic.

| Telehealth services allow me to maintain cancer screening practices.  | % (n)      |
|---|------------|
| Strongly disagree   | 3.5 (27)   |
| Disagree  | 29.6 (224) |
| Neutral   | 30.9 (234) |
| Agree   | 27.2 (206) |
| Strongly agree  | 3.2 (24)   |
| <b>During the COVID-9 pandemic I believe that changes in care seeking for cancer screening will lead to increased incidence of late stage cancer.</b> |            |
| Strongly disagree   | 1.3 (10)   |
| Disagree  | 15.9 (120) |
| Neutral   | 26.7 (202) |
| Agree   | 45.4 (344) |
| Strongly agree  | 5.7 (43)   |
| <b>I believe that telehealth visits allow providers to sufficiently maintain the patient-provider relationship.</b>                                   |            |
| Strongly disagree   | 2.4 (18)   |
| Disagree  | 17.0 (129) |
| Neutral   | 24.3 (184) |
| Agree   | 44.4 (336) |
| Strongly agree  | 8.1 (61)   |
| <b>During the COVID-19 pandemic my relationship with my patients has suffered greatly.</b>  |            |
| Strongly disagree   | 14.0 (106) |
| Disagree  | 41.6 (315) |
| Neutral   | 24.6 (186) |
| Agree   | 14.5 (110) |
| Strongly agree  | 2.6 (20)   |
| <b>During the COVID-19 pandemic I believe that most of my patients were afraid to come to the office for chronic disease management.</b>              |            |
| Strongly disagree   | 1.5 (12)   |
| Disagree  | 17.0 (129) |
| Neutral   | 15.9 (120) |
| Agree   | 50.5 (382) |
| Strongly agree  | 11.5 (87)  |
| <b>During the COVID-19 pandemic I have experienced no differences in health care seeking between minority and Non-Hispanic white patients.</b>        |            |
| Strongly disagree   | 11.6 (88)  |
| Disagree  | 33.0 (250) |
| Neutral   | 29.6 (224) |
| Agree   | 20.2 (153) |
| Strongly agree  | 2.6 (20)   |

were predominantly conducted by physicians capable of both audio and video visits (77.4%, n = 586). Additional participant demographic and telehealth capacity information are shown in Table 1.

#### 3.2. Cancer screening

Approximately 1/3 of physicians report previously postponing screening for breast, colon, and cervical cancer during COVID-19 with 45–51% of physicians not recommending changes in cancer screening

(Table 2). Significant differences were not observed between cancer screening type (Chi-square 30, df 25,  $p = 0.224$ ). A majority of physicians agreed (45.4%,  $n = 344$ ) or strongly agreed (5.7%,  $n = 43$ ) with the statement that changes in care seeking will lead to increased incidence of late stage cancer (Table 3). Only 1/3 of physicians agreed or strongly agreed with the statement that telehealth services allowed them to maintain cancer screening practices. Primary visit type was not associated with the ability to maintain cancer screening practices (Chi-square 11.8, df 8,  $p = 0.160$ ).

### 3.3. Factors impacting the patient-provider relationship

We sought to further explore factors impacting the patient-provider relationship using logistic regression models. When asked about the ability of telehealth visits to maintain the patient-provider relationship, 19.4% ( $n = 728$ ) of physicians did not believe telehealth was able to maintain this relationship and 52.5% ( $n = 397$ ) agreed with the statement that telehealth was able to maintain the patient-provider relationship. Additionally, 17.1% (737) endorsed concern that their relationship with their patients has suffered greatly whereas 55.6% ( $n = 421$ ) did not feel their relationship with their patients had suffered. Physicians who reported that their patients were afraid to come into the office (OR 2.77(1.33, 7.87)) were more likely to report an impaired relationship with their patients, whereas clinicians who reported that telehealth maintains their patient-provider relationship were less likely to report an impaired patient-provider relationship during the COVID-19 (OR 0.33 (0.17, 0.67)) (Table 4). Video capability and community size were not associated with a poorer patient-provider relationship.

### 3.4. Health care seeking practices in minority and Non-Hispanic white patients

When asked about whether differences were observed in health care seeking between minority and Non-Hispanic white patients, 44.6% ( $n = 735$ ) of respondents reported observed differences in health care seeking. Clinicians were less likely to report no differences in health care seeking between minority and white patients if they reported that patients were afraid to come into the office (OR 0.38 (0.21, 0.65)) and if their workplace serviced a larger community (OR 0.80 (0.66, 0.96)).

**Table 4**

Multivariate analysis on factors associated with the patient-provider relationship and care seeking behaviors.

|   | OR (95% CI)                          |
|---|--------------------------------------|
| Adjusted odds ratios for associations with clinicians who feel that their relationship with their patients suffered                   |                                      |
| <i>n</i>  | 377                                  |
| Percent of Patients with Video Capability (25% increments)  | 0.77 (0.31, 1.17) *                  |
| Observed No Differences in Care Seeking between Minority/White Patients   | 0.80 (0.35, 2.00) *                  |
| Patients Afraid to Come to Office   | 2.77 (1.33, 7.87) *                  |
| Believe Telehealth Maintains Patient-Provider Relationship  | 0.33 (0.17, 0.67) *                  |
| Increased Time Spent on Administrative Tasks  | 1.02 (0.99, 1.05) *                  |
| Larger Community  | 0.94 (0.74, 1.14) *                  |
| Adjusted odds ratios for associations with clinicians who observed no differences in care seeking between minority and white patients |                                      |
| <i>n</i>  | 324                                  |
| Patients Afraid to Come to Office   | 0.38 (0.21, 0.65) ‡                  |
| Increased Time Spent on Research Tasks  | 1.07 (1.01, 1.14) ‡                  |
| Increased Time Spent on Administrative Tasks  | 0.98 (0.95, 1.03) ‡                  |
| Larger Community  | 0.80 (0.66, 0.96) ‡0.80 (0.66, 0.96) |

\*Adjusted for respondent age/race/ethnicity/gender, access to high speed internet, and time spent on research tasks.

‡Adjusted for respondent age/race/ethnicity/gender, and access to high speed internet.

Factors identified as associated with differences in health care seeking between minority and white patients included physician perception of fear of an office visit and community size.

## 4. Discussion

Cancer screening is an essential part of primary care to allow for early detection and treatment of cancer. Early detection and treatment of cancer results in improved morbidity and mortality. The United States Preventive Services Task Force recommends screening for breast, cervical, and colon cancer with either a Grade A or Grade B recommendations and for this reason we have included these cancer screenings in our study (Nelson et al., 2016; [27]; Melnikow et al., 2018). During COVID-19, due to public health concerns necessitating a transition to increased use of telehealth, we sought to evaluate physician reported changes in cancer screening recommendations. Our findings demonstrate that approximately one third of physicians report delaying cancer screening earlier in COVID-19 but have now resumed their usual screening practices. However, many physicians did not change their screening practices during this time. A minority of physicians reported that telehealth services allowed them to maintain their screening practices while a majority reported that changes in cancer screening during COVID-19 would result in and increased incidence of late stage cancers. These findings have significant implications for primary care physicians with the increased use of telehealth services within primary care and in health maintenance visits. With the ongoing increased use of telehealth and for health maintenance during COVID-19 including for discussions regarding cancer screening, further evaluation of the potential benefits and opportunities for improvements in telehealth visits will be essential to ensure the persistence of continued appropriate cancer screening practices.

During COVID-19, the Centers for Medicare and Medicaid Services and the Center for Disease Control recommended a temporary delay in non-urgent medical visits including cancer screenings to reduce public health risk and preserve personal protective equipment (Warner, 2021). Recently published studies are seeking to assess the impact of this delay and physician recommendations regarding care. In our survey, approximately 1/3 of physicians reported recommending delays in cancer screening with subsequent resumption of usual screening practices. However, delays in care routine were multifactorial as there were physician associated recommendations to postpone care and patient associated hesitancy to visit health care facilities (Basu et al., 2021). In a recent survey, 2 out of 3 of American adults reported delaying or skipping their cancer screening during COVID-19 with 66% of individuals who reported delays reporting that it was their choice (Gregory, 2020). Consistent with this, in our survey, the majority of physicians reported concern that their patients were afraid to come into the office for chronic disease management. Although there are limitations in that only clinicians were surveyed as part of the study, our survey results indicated patient and clinician factors affecting delays in cancer screening during COVID-19.

The National Cancer Institute projects that disruptions in cancer screening during spring 2020 will result in 10,000 excess deaths from breast and colorectal cancers over the next decade (Sharpless, 2020). Although the number of screenings has rebounded since spring 2020; there is still a reported significant number of "missed" screenings from March to June 2020 with a projected number of 285,000 breast, 95,000 colon, and 40,000 cervical screening cancer exams (Song et al., 2021). Consistent with these reports; the majority of physicians in our survey report concern regarding the increased risk of late stage cancer due to delays in cancer screening during COVID-19. In the setting of delays in cancer screening, strategies to identify individuals who are overdue for screening within primary care and increase access to age-appropriate cancer screenings will be an important priority for physicians. In the setting of ongoing public health concerns due to COVID-19, strategies proposed to address screening deficits for colorectal cancer has been to

improved access to screening appointments, increase telehealth use, and increased use of home stool-based screening including FIT testing and other stool based testing (Basu et al., 2021; Issaka et al., 2021; Kadakuntla et al., 2021). Modelling studies have demonstrated that increased use of these home testing methods has the potential to mitigate some of the long-term consequences of delayed screening (Issaka et al., 2021).

During COVID-19, there was a concurrent increase in the usage of telehealth appointments in primary care for health maintenance. Telehealth services are likely to continue to expand even as the public health concern for COVID-19 decreases. Telehealth offers increased convenience for patients, decreased incidental costs including gas and lost wages, and can increase access to care for rural areas or individuals with difficulty with transportation (Powell et al., 2017). In previous studies including cross-sectional studies and retrospective cohort studies in United States, overall patient and clinician reported satisfaction both prior to and subsequent to COVID-19 has been reported though there has been variation in the relative satisfaction compared with in person visits (Ramaswamy et al., 2020; Harkey et al., 2020; Reed et al., 2020; Donelan et al., 2019). Although the introduction of telehealth has been received with reported patient satisfaction, there have been some limitations to its use including concerns regarding privacy, access to care by individuals with limited technology, and decreased utilization of telehealth by some demographic groups including older individuals, non-White individuals, and lower socioeconomic groups (Powell et al., 2017; Reed et al., 2020; Donelan et al., 2019; Cao et al., 2021). In our survey, 30.4% of primary care physicians reported that telehealth services allowed them to maintain their cancer screening practices. Additional more detailed qualitative research on the barriers to coordination of recommended cancer screening using telehealth will need to be conducted as follow on this finding to better understand implications for future care in order to maintain cancer screening practices. Small pilot studies have previously demonstrated the feasibility of telehealth to provide cancer screening services however this had not previously been widely implemented prior to COVID-19 (Cerezo-Ruiz and Parras-Mejias, 2016; Chuchu et al., 2018). The rapid implementation of telehealth during COVID-19 within primary care and other specialties has demonstrated patient satisfaction with this method of delivery of care but has simultaneously demonstrated that further research is needed to improve telehealth cancer screening processes and to understand the facilitators and barriers to telehealth implementation within the primary care setting.

The provider-patient relationship is central to providing primary care services. Visits conducted by telehealth have the potential to affect the patient-provider dynamic. In this study, less than 50% of physicians agreed with the statement that telehealth allowed them to maintain their patient-provider relationship. Furthermore 17% of physicians additionally reported that their relationship with their patients had suffered during the pandemic. Physicians who reported that telehealth allowed them to maintain their patient-provider relationship were less likely to report that their relationship with their patients had suffered during COVID-19. Patients have similarly previously reported concerns that the telehealth platform made it difficult to establish and maintain a patient-provider relationship (Gordon et al., 2020). It has previously been reported that telehealth visits receive greater satisfaction when a patient is already established and that patients more commonly choose to have a telehealth visit with their own primary care provider (Reed et al., 2020). Patients reported during telehealth interactions that they had the perception that providers paid less attention to them and that they were less likely to speak up with questions. Evaluation of the communication during telehealth encounters has found that telehealth visits are less likely to be patient centered, have a shorter total visit time, and decreased small talk and verbal praises than in face to face encounters (Henry et al., 2017). Although patient satisfaction is reported as high during visits, patient satisfaction reflects a composite of multiple visit factors which include the care provided, convenience, the interaction with provider, and other factors (ref Zhang et al., 2021; Powell

et al., 2017; Reed et al., 2020), telehealth visits are preferred in the setting of an existing patient-provider relationship. Evaluation of opportunities to improve the quality of the patient-provider relationship as telehealth continues to expand and factors would be beneficial to improve patient care.

Disparities have previously been documented in cancer screening associated with race, ethnicity, household income, education, insurance status, and sexual orientation with variations based on cancer screening type (AACR, 2020). During COVID-19, European and American studies have demonstrated exacerbation of disparities in cancer screening in underserved racial and ethnic groups, rural locations, and those in lower socioeconomic groups (Choy et al., 2022; Amram et al., 2021; DeGroof et al., 2021). Simultaneously there have been some concerns regarding equity of access to telehealth as within the realm of oncology care with significant disparities observed in the use of telehealth with Black, Hispanic and Asian patients (Smith and Bhardwaj, 2020). We sought to evaluate physician perception of health care seeking between minority and non-Hispanic white patients in the setting of concern for potential exacerbation of health disparities during COVID-19. Our survey found that 44.6% of physicians reported differences in health care seeking between minority and non-Hispanic white patients. Physicians who reported a concern that their patients were afraid to come to the office or who worked in a workplace that serviced a larger community were more likely to endorse differences in health care seeking. Further evaluation regarding the factors associated with differences in care seeking should be evaluated as telehealth services continue to expand within the health system.

There are limitations associated with this study. While, the study has a modest response rate, this seems typical of CERA surveys done in the past (Brown and Gerkin, 2019). Furthermore, the survey mechanism does not allow for further in-depth exploration of themes that can be conducted in qualitative research to better understand the factors associated with the patient provider relationship during COVID-19 and in telehealth encounters. The study additionally is limited in that it surveys physicians only and not patients or other clinic staff on perspective on cancer screening and the capacity of telehealth to conduct screening. Follow up studies to further assess qualitative work in both physicians and patients would be beneficial to better understand how telemedicine can be improved to promote better communication during visits. Although the survey was limited to physicians in the United States and Canada, telehealth adoption has been international information learned about cancer screening using telehealth can be applied beyond North America (Bashshur et al., 2020).

## 5. Conclusions

In this survey, we found that physicians report recommending delays in cancer screening due to COVID-19. Ongoing monitoring will need to assess the impact of delayed cancer screenings on cancer associated morbidity and mortality. Physicians report high use of telehealth during COVID-19 but also endorse limitations in the use of telehealth to maintain cancer screening practices and the maintenance of a patient-provider relationship. Further research will need to be conducted to characterize these limitations given the ongoing increased use of telehealth within primary care.

### *CRediT authorship contribution statement*

**Sarah T. Price:** Conceptualization, Investigation, Writing – original draft. **Arch G. Mainous:** Conceptualization, Investigation, Writing – review & editing. **Benjamin J. Rooks:** Formal analysis, Writing – review & editing.

### **Declaration of Competing Interest**

The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

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