

# Patients Perceptions of Telemedicine Visits Before and After the Coronavirus Disease 2019 Pandemic

Bree E. Holtz, PhD

Department of Advertising and Public Relations, Michigan State University, East Lansing, Michigan, USA.

## Abstract

**Purpose:** This study sought to determine whether the necessitated use of telemedicine due to coronavirus disease 2019, and limited choice of both the provider and patient, impacts the perceptions of telemedicine by patients who experienced telemedicine prepandemic and those who first experienced telemedicine during the pandemic.

**Methodology:** Participants for this survey were a convenience sample. An invitation to participate was shared through social media and e-mail listservs. To participate, individuals had to be at least 18 years of age and gave consent to their data being used. The online survey took ~10–15 min to complete, the survey was available from March 31 to April 20, 2020.

**Results:** Two hundred sixty-four ( $n=264$ , 60.8%) individuals had used telemedicine on or before December 2019 and 170 (39.2%) individuals used telemedicine for the first time January 2020 or later. There were no significant differences in demographics between groups, except that new users were more likely to have a primary care physician [ $F(407)=13.51$ ,  $p<0.001$ ]. Satisfaction of telemedicine was measured using a 10-item scale, demonstrating that all participants were overall satisfied with their telemedicine experience(s), (mean=1.67, standard deviation=0.61). Broadly, the differences in perceptions between the groups included the reasons for using telemedicine, perceptions of quality of in-person care, continuity of care, and a technical issue.

**Conclusions:** Overall, patients are satisfied using telemedicine, however, for new users, both providers and patients, some acclimation needs to occur.

**Keywords:** telemedicine perceptions, COVID-19, patient perceptions

## Introduction

Telemedicine or telehealth has been around for decades; however, the uptake of these services has remained low, despite the myriad of reported benefits. However, the current coronavirus pandemic is putting telemedicine into the spotlight, particularly in the United States. In 2020, the U.S. Congress passed an act (P.L.116–123) that allowed for qualified providers to bill Medicare for care that is provided through telehealth during this public health emergency.<sup>1</sup> Furthermore, in an effort to reduce the risks of transmitting the virus, health care providers have been increasingly scheduling and seeing patients through telemedicine.<sup>2</sup>

There have been many studies that have demonstrated potential barriers and challenges for the use of telemedicine, by both providers and patient.<sup>3–5</sup> However, since the advent of telemedicine, there has never been a global pandemic of this scale that has precipitated the adoption of these services. Because of the pandemic, many health care providers are only seeing patients through telemedicine. What is currently unknown is how the people who have used telemedicine before the pandemic and those who have used telemedicine for the first time during the pandemic perceive telemedicine.

For individuals who used telemedicine before the pandemic, it was a choice that they made to receive care. However, those who received care after January 2020 were likely limited to a telemedicine visit. This study sought to determine whether the necessitated use of telemedicine, and limited choice of both the provider and patient, impacts the perceptions of telemedicine.

## Materials and Methods

Participants for this survey were a convenience sample. An invitation to participate was shared through social media and e-mail listservs. To participate, individuals had to be at least 18 years of age and gave consent to their data being used. This study was approved by the Michigan State University Institutional Review Board.

This cross-sectional online survey was developed through a review of the literature and specifically modifying questions

**Table 1. Demographics**

	TOTAL, <i>N</i> (%)	PAST USERS, <i>N</i> (%)	NEW USERS, <i>N</i> (%)
	434 (100)	264 (60.8)	170 (39.2)
<b>Gender</b>			
Female	390 (89.2)	238 (89.5)	152 (89.4)
Male	14 (3.2)	8 (3)	6 (3.5)
Gender nonconforming or transgender	3 (0.7)	2 (0.8)	1 (0.6)
Prefer not to answer	27 (6.9)	16 (6)	11 (6.5)
<b>Year born</b>			
1948–1960	22 (5)	10 (4)	12 (7.2)
1961–1970	60 (13.8)	39 (14.7)	21 (12.5)
1971–1980	115 (26.4)	70 (26.3)	45 (26.6)
1981–1990	153 (35.1)	97 (36.5)	56 (33)
1991–1998	27 (5.5)	17 (6.5)	10 (6)
Prefer not to answer	59 (13.5)	33 (12.4)	26 (15.3)
<b>Income</b>			
\$10,000–19,999	3 (0.7)	3 (1.1)	0
\$20,000–29,999	6 (1.4)	2 (0.8)	4 (2.4)
\$30,000–39,999	13 (3.2)	8 (3)	5 (2.9)
\$40,000–49,999	11 (2.5)	7 (2.6)	4 (2.4)
\$50,000–59,999	15 (3.4)	11 (4.1)	4 (2.4)
\$60,000–69,999	22 (5)	16 (6)	6 (3.5)
\$70,000–79,999	21 (4.8)	11 (4.1)	10 (5.9)
\$80,000–89,999	18 (4.1)	8 (3)	10 (5.9)
\$90,000–99,999	18 (4.1)	7 (2.6)	11 (6.5)
\$100,000–149,999	109 (25.1)	68 (25.6)	41 (24.1)
\$150,000+	142 (32.3)	89 (33.5)	53 (31.2)
Prefer not to answer	58 (13.5)	36 (13.6)	22 (13)
<b>Education</b>			
Regular high school diploma	2 (0.5)	1 (0.4)	1 (0.6)
Some college, but <1 year	1 (0.2)	1 (0.4)	0
1 or more years of college credit, no degree	21 (4.8)	12 (4.5)	9 (5.3)
Associate's degree	9 (2.1)	5 (1.9)	4 (2.4)
Bachelor's degree	142 (32.6)	81 (30.5)	61 (35.9)
Master's degree	149 (34.2)	91 (34.2)	58 (34.1)
Professional degree	40 (9.2)	29 (10.9)	11 (6.5)
PhD	44 (10.1)	29 (10.9)	15 (8.8)
Prefer not to answer	28 (6.4)	17 (6.4)	11 (6.5)

continued →

**Table 1. Demographics** *continued*

	TOTAL, <i>N</i> (%)	PAST USERS, <i>N</i> (%)	NEW USERS, <i>N</i> (%)
	434 (100)	264 (60.8)	170 (39.2)
Employment status			
Employed for wages	316 (72.5)	189 (71.1)	127 (74.7)
Self-employed	26 (6)	19 (7.1)	7 (4.1)
Out of work and looking for work	11 (2.5)	7 (2.6)	4 (2.4)
Homemaker	25 (5.7)	16 (6)	9 (5.3)
Student	7 (1.6)	7 (2.6)	0
Retired	10 (2.3)	6 (2.3)	4 (2.4)
Military	1 (0.2)	1 (0.4)	0
Unable to work	3 (0.7)	2 (0.8)	1 (0.6)
Other	8 (1.8)	2 (0.8)	6 (3.5)
Prefer not to answer	29 (6.7)	17 (6.4)	12 (7.1)
Insurance status			
Insurance through employer	329 (75.5)	204 (76.7)	125 (73.5)
Insurance purchased directly	23 (5.3)	13 (4.9)	10 (5.9)
Medicare	9 (2.1)	5 (1.9)	4 (2.4)
Medicaid	6 (1.4)	5 (1.9)	1 (0.6)
TRICARE or other military health care	2 (0.5)	1 (0.4)	1 (0.6)
No health insurance	3 (0.7)	2 (0.8)	1 (0.6)
Other	34 (7.8)	18 (6.8)	16 (9.4)
Prefer not to answer	30 (6.9)	18 (6.8)	12 (7.1)
Race			
White	367 (84.2)	224 (84.2)	143 (84.1)
Black or African American	4 (0.9)	4 (1.5)	0
American native	1 (0.2)	0	1 (0.6)
Asian Indian	4 (0.9)	3 (1.1)	1 (0.6)
Asian	6 (1.4)	3 (1.1)	3 (1.8)
Other	4 (0.9)	2 (0.8)	2 (1.2)
Prefer not to answer	50 (11.5)	30 (11.3)	20 (11.8)
Overall health status <sup>a</sup>			
Mean (SD)	3.87 (0.80)	3.85 (0.84)	3.9 (0.72)
Have a primary care provider			
Yes	364 (83.4)	217 (81.6)	147 (86.5)*
No	45 (10.3)	33 (12.4)	12 (7.1)
Prefer not to answer	27 (6.4)	16 (6)	11 (6.5)

continued →

**Table 1. Demographics** *continued*

	TOTAL, <i>N</i> (%)	PAST USERS, <i>N</i> (%)	NEW USERS, <i>N</i> (%)
	434 (100)	264 (60.8)	170 (39.2)
Access to internet			
Cellular data only	13 (3)	11 (4.1)	2 (1.2)
Broadband	91 (20.9)	54 (20.3)	37 (21.8)
Satellite internet	1 (0.2)	0	1 (0.6)
Cellular data and broadband	292 (67)	178 (66.9)	114 (67.1)
Cellular data and satellite	2 (0.5)	1 (0.4)	1 (0.6)
Cellular data and broadband and satellite	2 (0.5)	1 (0.4)	1 (0.6)
Cellular data and broadband and satellite and dial-up	1 (0.2)	1 (0.4)	0
Cellular data and dial-up	3 (0.7)	1 (0.4)	2 (1.2)
Prefer not to answer	31 (7.1)	19 (7.1)	12 (7.1)
Number of devices connected to the internet (laptop, smart watch, tablet, smart phone, etc.)			
1 Device	6 (1.4)	5 (1.9)	1 (0.6)
2 Devices	54 (12.4)	34 (12.8)	20 (11.8)
3 Devices	106 (24.3)	64 (24.1)	42 (24.7)
4 Devices	132 (30.3)	83 (31.2)	49 (28.8)
5 Devices	72 (16.5)	41 (15.4)	31 (18.2)
6 Devices	34 (7.8)	19 (7.1)	15 (8.8)
Prefer not to answer	32 (7.3)	20 (7.5)	12 (7.1)

\* $p < 0.001$ .<sup>a</sup>1 = excellent; 2 = very good; 3 = good; 4 = fair; 5 = poor.

SD, standard deviation.

from both Gustke et al.<sup>6</sup> and Bergquist et al.<sup>7</sup> The telemedicine items were answered on a Likert scale, 1 = strongly agree and 5 = strongly disagree. In addition, demographic questions were asked, including insurance status, overall health status, having a primary care provider (PCP), access to the internet, and number of devices that are connected to the internet. The online survey took ~10–15 min to complete, the survey was available from March 31 to April 20, 2020.

Descriptive statistics were used to describe the population. In addition, data were analyzed through analysis of variances using IBM SPSS for Mac, Version 26.0., significance was set at  $p < 0.05$ .

## Results

A total of 1,011 participants completed the survey. Of those responses, 434 had used telemedicine. Two hundred sixty-four ( $n = 264$ , 60.8%) had used telemedicine on or before December 2019 and 170 (39.2%) used telemedicine

for the first time January 2020 or later. There were no significant differences in demographics between groups, except that new users were more likely to have a PCP [ $F(407) = 13.51$ ,  $p < 0.001$ ]. All demographic data are given in *Table 1*.

Satisfaction of telemedicine was measured using a 10-item scale ( $\alpha = 0.94$ ), demonstrating that people were overall satisfied with their telemedicine experience(s), (mean = 1.67, standard deviation = 0.61). In addition, using telemedicine in the future was correlated with the satisfaction measure,  $R = 0.233$ ,  $p < 0.001$ . When examining the differences between the groups, those who were past users (on or before December 2019) were more satisfied with the telemedicine services [ $F(399) = 5.38$ ,  $p = 0.02$ ] than new users. The full items, means, and standard deviations are provided in *Table 2*.

Broadly, the differences in perceptions included the reasons for using telemedicine, perceptions of quality of in-person care, continuity of care, and a technical issue. Past users were

Table 2. Survey Items, Means, and Standard Deviations

SURVEY ITEM	PAST USER	NEW USER
	MEAN (SD)	MEAN (SD)
Overall satisfaction scale (10 items)	1.61 (0.54)	1.75 (0.69)*
I had difficulty hearing the health care provider over the computer/mobile system	4.33 (0.71)	4.14 (0.99)*
I had difficulty seeing the health care provider over the computer/mobile system	4.09 (0.89)	4.02 (1.08)
I would have gotten better care if I had seen the health care provider in person	3.47 (1.01)	3.19 (1.17)*
The next time I would prefer to see a health care provider in person despite the possible inconvenience	3.32 (1.04)	2.77 (1.13)**
It was easy to arrange an appointment	1.60 (0.73)	1.61 (0.78)
The health care provider dominated the conversation	3.74 (0.82)	3.79 (0.76)
The health care provider spent little time taking my medical history	3.40 (1.09)	3.55 (1.04)
There was less communication with the provider (than I normally receive in person) using telemedicine	3.51 (1.10)	3.61 (1.20)
The health care provider who provided me care genuinely seemed to care about me	1.90 (0.90)	1.68 (0.86)*
I felt like my privacy was invaded during the telemedicine visit	4.46 (0.65)	4.50 (0.68)
I am worried about the confidentiality of my private information being exchanged through the telemedicine visit	4.11 (0.98)	4.03 (1.08)
I am worried about the continuity of care (i.e., I do not see my same provider every time)	3.57 (1.14)	3.84 (1.09)*
I was concerned that my primary care provider would not get my visit information	3.69 (1.07)	4.00 (0.88)*
I was concerned that my insurance would not cover my telemedicine visit	3.92 (1.12)	3.77 (1.01)
I generally used telemedicine when my provider is not open (after hours, holidays, etc.)	2.79 (1.15)	3.51 (1.05)**
I generally use telemedicine when I feel too sick to leave the house	3.02 (1.14)	3.57 (0.99)*
I have used telemedicine because I did not feel like my condition was too urgent	2.38 (1.15)	3.11 (1.22)**
I did not want to infect (cold, flu, etc.) other people in a waiting room	3.13 (1.21)	2.95 (1.25)
I did not want to get infected in the waiting room by other people (cold, flu, etc.)	2.98 (1.32)	2.23 (1.31)**
It is easy to get into my primary care provider	2.77 (1.15)	2.42 (1.11)*
I am worried about the accuracy of the information from the telemedicine health care provider	3.94 (0.87)	3.87 (0.93)
1 = strongly agree; 2 = agree; 3 = neutral; 4 = disagree; 5 = strongly disagree.		
* $p < 0.05$ .		
** $p < 0.001$ .		
SD, standard deviation.		

more likely to agree that they used telemedicine when their provider was not open [ $F(406) = 39.73$ ,  $p < 0.001$ ], they were too sick to leave the house [ $F(404) = 28.59$ ,  $p < 0.001$ ], and did not perceive their condition to be urgent [ $F(404) = 24.04$ ,  $p < 0.001$ ]. Furthermore, past users of telemedicine disagreed more that they would have gotten better care in-person [ $F(429) = 6.34$ ,  $p = 0.01$ ] and would have preferred to see a provider in person [ $F(429) = 27.06$ ,  $p < 0.001$ ] compared with the new users of telemedicine. New users of telemedicine more strongly agreed that they used telemedicine to avoid waiting rooms and risk getting sick [ $F(406) = 30.99$ ,  $p < 0.001$ ]. In addition, newer users of telemedicine perceived less worries

regarding the continuity of care [ $F(409) = 5.89$ ,  $p = 0.02$ ] and sharing visit information with their PCP [ $F(406) = 9.42$ ,  $p = 0.002$ ]. They also agreed more that the provider genuinely cared about them [ $F(429) = 6.43$ ,  $p = 0.01$ ] compared with past users. Finally, new users of telemedicine perceived more problems hearing the provider through telemedicine more than past users [ $F(428) = 5.679$ ,  $p = 0.02$ ]. All other items were statistically similar between the two groups.

## Discussion

The results of this study suggest that telemedicine is perceived to be a very satisfactory approach to receive care. The

newer users of telemedicine were less concerned about their PCP getting their visit information, perhaps because their visit was conducted by their PCP. Furthermore, the new users, because they did not have a choice in the mode of the visit, continued to want to see their provider in person more than past users. Previously, telemedicine visits might not have been available through PCPs, and past users most likely utilized a system that was specifically designed for telemedicine visits only, not with a PCP, possibly during night hours and holidays. This conclusion is strengthened considering the past users in this study were less likely to have a PCP. However, when an unexperienced (with telemedicine) provider utilizes telemedicine, they might not have the same technical expertise and experience communicating over technology as other telemedicine-only providers, which may have caused the difference in the perception regarding hearing.

As with every study, there are limitations. This study's participants were predominately white, female, highly educated, and wealthier than the general public. This is due to the nature of convenience sampling. Further study should explore a more diverse population to examine whether differences in perceptions between those who have used telemedicine and those who have not are similar to these findings. In addition, this study used self-reported measures that also add bias into the results. Even with those limitations, the results of this survey provide a glimpse into perceptions of individuals' use of telemedicine due to the coronavirus pandemic, which could be useful to argue for the services to continue to be reimbursed and implemented permanently.

During this pandemic, there has been an unprecedented adoption and use of telemedicine.<sup>8</sup> Scholars and practitioners who study telemedicine should appreciate that overall the general public has positive perceptions of this service. There are still some unresolved questions and issues that should be explored, including the level of satisfaction over time and how these perceptions may change. If telemedicine is going to continue to be a core method of providing and receiving health care in the future, some of the challenges that these users experienced and perceived should be addressed.

## Disclosure Statement

No competing financial interests exist.

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Address correspondence to:

Bree E. Holtz, PhD

Department of Advertising and Public Relations

Michigan State University

404 Wilson Road, Room 309

East Lansing, MI 48824-1212

USA

E-mail: bholtz@msu.edu, breeholtz@gmail.com

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