

Telehealth during the pandemic: Patient perceptions and policy implications

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Abstract

Introduction: Telehealth's potential to improve access to specialty health care, increase favorable patient outcomes, and save money demands attention. Unfortunately, patients often fail to embrace telehealth. The COVID-19 pandemic fueled greater telehealth usage globally. Little is known about patient perceptions of telehealth in the context of a pandemic. Therefore, we sought to understand patient perceptions of telehealth during the COVID-19 pandemic and explore relevant policy implications.

Design: Researchers used a cross-sectional, non-experimental design to survey 366 patients across two telehealth programs at a Mississippi academic health sciences center between November 1, 2021 and November 15, 2021.

Methods: As part of a larger, psychometric study on patient acceptance of telehealth, participants rated the item, "The COVID-19 pandemic has made me more open to using telehealth" on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). Means of the different groups were analyzed using independent *t*-test and one-way ANOVA with Bonferroni post-hoc multiple comparisons.

Results: Of the total participants, 73% ($n = 366$) either agreed or strongly agreed that the COVID-19 pandemic had made them more open to using telehealth. Significant differences existed by age ($p = 0.016$), race/ethnicity ($p = 0.015$), and sex ($p < 0.001$), however, groups did not differ by age during post-hoc analysis. A significant difference in the mean responses was observed between black participants ($M = 4.29$) and white participants ($M = 3.91$; $p = 0.011$). In addition, female participants ($M = 4.11$) rated the item higher than male participants ($M = 3.65$).

Conclusion: As access to telehealth increased due to the COVID-19 pandemic, patients' perceptions to telehealth seem to have shifted in the positive direction as well. Findings may be used to support expansion of telehealth and advocacy for patients in a variety of settings.

Clinical Relevance: Study findings indicate that participants of telehealth are more open to using telehealth due to the COVID-19 pandemic. Implementing telehealth should be a priority to increase access to care for those who have limited access to specialty care, and policymakers should advocate to decrease barriers to telehealth within their institutions.

KEYWORDS

COVID-19 pandemic, patient perceptions, telehealth acceptance, telehealth policy

According to the Centers for Disease Control and Prevention (CDC) (2022), in the United States alone, by 05/10/2022 there have been over 81.5 million positive cases and over 995,000 deaths from COVID-19. Mississippi has been no exception, with over 799,000 total cases and over 12,000 deaths since the beginning of the pandemic (MSDH, 2022). This has provided a unique challenge for those working in the community healthcare setting.

Along with the disruption to normal life, healthcare has had to adapt appropriately, nurses especially being challenged to grow and respond to various crises throughout the pandemic (Melnikov et al., 2022). One of the areas impacted by the pandemic has been telehealth (Ohannessian et al., 2020). For those in rural areas, telehealth has the potential to increase access and provide better health outcomes (WHO, 2016). The World Health Organization (WHO) (2016) defined telehealth as:

the delivery of health care services, where patients and providers are separated by distance. Telehealth uses [Information and Communication Technologies (ICTs)] for the exchange of information for the diagnosis and treatment of diseases and injuries, research and evaluation, and for the continuing education of health professionals (p. 56).

Within this broad definition, telehealth can be delivered in a variety of applications. Common types of telehealth include communication technologies such as videoconferencing (Fischer et al., 2020), remote patient monitoring, virtual visits, and chat-based interactions (ATA, 2020a). Cellphone applications have been developed for dermatology (Horsham et al., 2016) and, health kiosks allow interactions with health care providers by video conferencing (Abraham et al., 2018). Also, telehealth use increased during the pandemic to provide mental health services (Zhou et al., 2020).

Before the pandemic, 66% of healthcare consumers were willing to use telehealth, but only 8% had tried it (Telehealth index: 2019 consumer survey, 2019). According to Mann et al. (2020), telehealth visits increased by 683% in one New York hospital. In Mississippi, one center for telehealth experienced a 286% increase in telehealth visits and an increase in telehealth users of 5704 percent during the pandemic (*Disruption, innovation and growth: A story of perseverance*, 2021).

Not only has telehealth usage skyrocketed among patients, but this rapid increase in telehealth usage also forced providers to use telehealth—some, for the first time (Waizinger et al., 2021). For providers, two longstanding barriers to telehealth include reimbursement of telehealth services and regulations of telehealth providers (Institute of Medicine, 2012). Specifically, the Centers for Medicare and Medicaid Services (CMS) often would not provide

reimbursement for telehealth visits, and regulations limited which practitioners could bill for telehealth services, keeping providers from adopting telehealth (Institute of Medicine, 2012). Fortunately, loosening of these regulations and increase of reimbursement have been effects of the COVID-19 pandemic. In 2021, under the authority of the Coronavirus Aid, Relief, and Economic Security Act (CARES Act), CMS issued a blanket waiver to “[expand] the types of health care professionals that can furnish distant site telehealth services to include all those that are eligible to bill Medicare for their professional services” (CMS, 2021, p. 1). This blanket waiver will stay in effect until the end of the public health emergency declaration. At that time pre-pandemic restrictions for providers and telehealth will be reinstated (CMS, 2021). As previously mentioned, since the pandemic providers have had access to telehealth in an unprecedented way. However, have patients actually become more open to using telehealth?

Mississippi is a rural state with a population around 2.9 million (QuickFacts: Mississippi, 2020). People living in over 64% of Mississippi counties have to drive at least 40 minutes to receive specialty care (The University of Mississippi Medical Center Center for Telehealth, 2017). Also, 18.7% of Mississippians live in poverty, which makes reliable transportation challenging (QuickFacts: Mississippi, 2020). Thus, a huge barrier exists to care that rural Mississippians need. Not only this, but the Mississippi State Department of Health (2017) stated, “Mississippi ranks last, or close to last, in almost every leading health outcome” (para. 1). Furthermore, during the pandemic, Mississippi’s response to implementing COVID-19 precautions fell behind other states, requiring statewide masking for 56 days, the shortest duration of any state (“Executive Order No. 1516,” 2020; “Executive Order No. 1525,” 2020). Mississippi’s poor health metrics and limited access to specialty care create a unique challenge for Mississippians trying to manage their health. Telehealth offers delivery of specialty care to Mississippians who would otherwise have difficulty finding that care, as seen during the pandemic (Mills et al., 2021). If using telehealth can increase access to specialty care and create better health outcomes, then understanding patient acceptance of telehealth is acutely important for communities with limited healthcare access.

This study sought to answer that question: Have patients’ perceptions of telehealth increased favorably due to the COVID-19 pandemic? Investigators asked participants to rate their perception of telehealth as a part of a study designed to estimate validity and reliability of a 32-item healthcare technology acceptance questionnaire. Briefly, the questionnaire was developed to study patients’ acceptance of telehealth, and was theoretically derived from the Health Belief Model (HBM), the Health Promotion Model (HPM), and the Unified Theory of Acceptance and Use of Technology (UTAUT). Since telehealth involves perceptions

regarding both health and technology, this new questionnaire combined these theoretical models from the realms of healthcare (HBM and HPM) and technology (UTAUT) in order to understand patients' acceptance of telehealth. Spheres of Influence, Self-Efficacy, Disease Perception, Perceived Barriers, and Intention to Use were identified as constructs that may explain patient acceptance.

The investigators sent the questionnaire to participants of two statewide telehealth programs, UMMC 2 You and Remote Patient Monitoring (RPM). UMMC 2 You, a patient-driven telehealth program, allows users to access medical care for minor issues, whereas the RPM program is a provider-driven telehealth program used for management of chronic health diseases such as diabetes and heart failure. (The University of Mississippi Medical Center Center for Telehealth, 2017). Pre-pandemic, RPM had about 160 patients enrolled in a 12-month period, while the UMMC 2 You program had over 3400 enrollees with over 2300 appointments made in a 12-month period. In April of 2020 alone, UMMC 2 You consultations totaled over 11,500 (Cummins, 2020). Studying these two programs allows for observing how patient perceptions may vary between those with minor health issues and those with more chronic disease processes. Also, since RPM is provider-initiated and UMMC 2 You is patient-initiated, this provided the opportunity to observe the influence of the provider on patient perceptions of telehealth.

DESIGN AND METHODS

We used a cross-sectional, non-experimental design to survey patients in two telehealth programs from November 1, 2021 to November 15, 2021. Development of the questionnaire was conducted in two phases: Phase I consisted of expert responses regarding item relevance, as well as patient responses to the questionnaire regarding readability and clarity of items. Due to feedback from the experts, the item regarding the COVID-19 pandemic was added. In Phase II of the study, participants of the two telehealth programs were invited to answer the questionnaire. To further estimate validity and reliability, the data was searched for any errors or omissions and then exploratory factor analysis and item analysis were conducted, followed by computing a Cronbach's alpha coefficient. Independent *t*-test and ANOVA were conducted to determine if there were any differences in the means among the groups. Incomplete questionnaires were discarded.

Potential participants received an email with a description of the study, followed by a link to the questionnaire. Email addresses were selected, with participation from the center for telehealth, if patients had signed up for or used either telehealth platform in the previous 12 months. Of the 8000 emails that were delivered, 366 patients fully answered the 32-item online questionnaire and were enrolled in the study. Participants were asked to rate their response to the question "The COVID-19 pandemic has made me more open to using telehealth" on a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree). We

TABLE 1 Demographic characteristics of the participants

Characteristic	<i>n</i>	%
Telehealth system		
UMMC 2 You	301	82.2
RPM	21	5.7
Other	44	12
Age (years)		
21–39	123	33.6
40–65	214	58.5
65+	29	7.9
Sex		
Male	79	21.6
Female	287	78.4
Race/ethnicity		
American Indian or Alaska Native ^a	1	0.3
Asian ^a	6	1.6
Black or African American	95	26
Hispanic or Latino ^a	4	1.1
White	251	68.6
Other ^a	4	1.1
Prefer Not to Answer ^a	5	1.4

^aRecoded into variable "Other" due to small numbers.

also asked participants to select the most recently used telehealth system from the following options: UMMC 2 You, RPM, or Other. Participants also provided information regarding sex (Male, Female), race/ethnicity (American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, White, Other, Prefer Not to Answer), and age (21–39, 40–65, 65+). Due to small numbers for various ethnic groups, the variable was recoded into White, Black, and Other.

Participants' responses to the online questionnaire were downloaded from the Research Electronic Data Capture (REDCap) platform and imported into the IBM Statistical Package for the Social Sciences (SPSS) 28.0® for statistical analysis. Patient responses, per institution policy, were either kept on the REDCap platform or downloaded to a password protected flash drive and kept in a locked office. Participant responses were not linked to their email address in order to maintain privacy and confidentiality. Descriptive statistics were run on the data (Table 1), as well as an independent *t*-test for sex, and ANOVA for telehealth system, race/ethnicity, and age group.

RESULTS

The majority of participants use UMMC 2 You (*n* = 301, 82.2%), 21 were users of RPM, and 44 participants used some "Other" telehealth program. The majority of participants (58.5%) were in the 40–65 age range while 33.6% were in the 21–39 age range, and 7.9%

were in the 65+ age range. Most participants (78.4%) were female and 21.6% were male. The racial distribution was 68.6% White, 26% Black, and 5.4% for other ethnicities (Table 1).

Most (73.0%) of the participants Agreed or Strongly Agreed with the statement that the COVID-19 pandemic had made them more open to using telehealth. However, 16.1% were Neutral to the statement, and only 10.9% Disagreed or Strongly Disagreed (Table 2). There were no statistically significant differences in participants' responses to the statement across those using different types of telehealth ($p = 0.393$), but there were differences between black participants and white participants ($p = 0.015$) and males and females ($p < 0.001$).

A one-way ANOVA was performed to compare the effect of age and race/ethnicity on the questionnaire item (Tables 3 and 4). The age groups were 21–39, 40–65, and 65+, and race/ethnicity groups were White, Black, and Other. For age, a one-way ANOVA revealed that there was a statistically significant difference in the means of the item, $F(2, 336) = 4.160$, $p = 0.016$, between at least two groups, however, Bonferroni's test found that the mean value for the item was not significantly different between the age groups. For race/ethnicity, the one-way ANOVA revealed that there was a statistically significant difference in the item, $F(2, 363) = 4.278$, $p = 0.015$, among different ethnicities. Bonferroni's test revealed that the average rating among Black participants (4.29) was statistically higher than White participants (3.91), indicating more openness to using telehealth (mean difference = 0.386, $p = 0.011$), (Table 5). An independent t-test revealed that females were more likely to be open to using telehealth than males (mean difference = 0.469, $p < 0.001$), with females having an average rating of 4.11 and males having an average of 3.65 (Table 6). Mean differences and the associated p -values are reported in Table 7.

DISCUSSION AND POLICY IMPLICATIONS

The results of this study suggest that the COVID-19 pandemic has had a positive effect on openness to telehealth among users of telehealth systems in the southern United States with almost three quarters of participants indicating that they were more open to using telehealth since the start of the pandemic. This is an increase in telehealth openness, since a previous study completed before the pandemic showed that only about 51% of patients were willing to use

telehealth (Welch et al., 2017). Also, differences between age, race/ethnicity, and sex suggest that these various characteristics should be considered when implementing telehealth. Access to telehealth has obviously skyrocketed since the beginning of the pandemic, but patient perceptions seem to be shifting as well. Telehealth providers and stakeholders should be investing in the future of telehealth through training for providers (Rutledge et al., 2020), establishing new telehealth services, and informing rural communities of the increasing availability of telehealth services.

One observation from the analysis was that while the one-way ANOVA revealed differences across the age groups, further analysis did not identify any differences, although the 21–39-year age group had a higher average rating of this item ($M = 4.23$). The older the participant, the lower the average rating of openness to telehealth. Some studies of telehealth acceptance have shown that age can be a significant determinant of telehealth usage (Hennemann et al., 2016; Lee & Rho, 2013; Ware et al., 2019), while others suggest that age does not have a significant effect on telehealth acceptance (Dou et al., 2017; Tavares & Oliveira, 2016). Future studies could look at smaller age group increments to see where these differences actually exist. Policymakers should understand that age could be a factor in ultimate openness and adoption of telehealth.

Importantly, the pandemic has had differing levels of influence on factors like ethnicity and sex. These findings suggest that Black participants are more open to using telehealth due to the COVID-19 pandemic ($M = 4.29$). Other studies also found that Black participants were more likely than White participants to seek telehealth care for minor health problems since the beginning of the pandemic (Campos-Castillo & Anthony, 2021). This is an important shift since Fischer et al. (2020) found that Black participants were significantly less likely to express willingness to use certain types of telehealth around the beginning of the pandemic. Whereas all groups on average rated the item as Agree or Strongly Agree, this increase in openness to telehealth is an encouraging sign for the future of telehealth development.

According to Qian et al. (2021), usage of telehealth increased among males significantly more than females after the start of the pandemic. The current study suggests that, while usage increased among males, females have become more open than males to using telehealth. Thus, our findings echo literature that suggests that females were more likely to adopt telehealth pre-pandemic (FAIR Health, 2019). Policies surrounding telehealth should be implemented in such a way that considers that sex and ethnicity can influence one's openness to telehealth.

Other policy implications from this study warrant consideration. Because of the increased openness of patients toward telehealth, nurses should advocate for permanently removing the barriers to telehealth reimbursement. Also, nurses should advocate for permanently removing the restrictions for the types of providers that can bill for telehealth services, as has been suggested elsewhere (Smith & Raskin, 2020). The American Telemedicine Association (ATA) advocates specifically for the removal of these and other barriers across the country (ATA, 2020b; Zebley, 2022). Patients in rural

TABLE 2 Totals for item "The COVID-19 pandemic has made me more open to using telehealth"

	<i>n</i>	%
Strongly Disagree	14	3.8
Disagree	26	7.1
Neutral	59	16.1
Agree	109	29.8
Strongly Agree	158	43.2
Total	366	100

TABLE 3 "The COVID-19 pandemic has made me more open to using telehealth" by age group (year)

21-39		40-65		65+		F(2, 363)	p-value
M	SD	M	SD	M	SD		
4.23	0.904	3.93	1.153	3.69	1.391	4.2 ^a	0.016

^aIndicates mean difference is significant at 0.05.

Abbreviations: M, mean; SD, standard deviation.

TABLE 4 "The COVID-19 pandemic has made me more open to using telehealth" by race/ethnicity

White		Black		Other		F(2, 363)	p-value
M	SD	M	SD	M	SD		
3.91	1.136	4.29	0.977	4	1.124	4.3 ^a	0.015

^aIndicates mean difference is significant at 0.05.

Abbreviations: M, mean; SD, standard deviation.

TABLE 5 "The COVID-19 pandemic has made me more open to using telehealth" using Bonferonni test for race/ethnicity

(I) Ethnicity	(J) Ethnicity	Mean difference (I - J)	SE	p-value	95% confidence interval	
					Lower bound	Upper bound
White	Black	-0.386 ^a	0.132	0.011	-0.7	-0.07
	Other	-0.092	0.255	1	-0.7	0.52
Black	White	0.386 ^a	0.132	0.011	0.07	0.7
	Other	0.295	0.27	0.826	-0.35	0.94
Other	White	0.092	0.255	1	-0.52	0.7
	Black	-0.295	0.27	0.826	-0.94	0.35

^aIndicates mean difference is significant at 0.05.

TABLE 6 "The COVID-19 pandemic has made me more open to using telehealth" by sex

Male		Female		t	p
M	SD	M	SD		
3.65	1.19	4.11	1.06	-3.39	<0.001 ^a

^aIndicates mean difference is significant at 0.05.

Abbreviations: M, mean; SD, standard deviation.

areas often lack access to specialty care (Nguyen et al., 2016), therefore, removing this barrier for providers can increase the availability of specialty services.

The significance for nursing is manifold. Not only can increasing telehealth services increase access for patients, but it can also decrease the hospital burden and reduce the workload for nurses. Nursing shortages have dramatically increased during the pandemic. The US Department of Health and Human Services released data at the beginning of this year that over 19% of US hospitals were experiencing a critical staffing shortage (Plescia & Gooch, 2022). Unique telehealth solutions can be leveraged to increase nursing presence, even when nursing supply is low, as has been the experience of places like the Mercy Virtual Care Center (Klingensmith & Knodel, 2016). Nurses and other providers can encourage administrators to

consider these different strategies to help relieve the burden placed on the healthcare system due to staffing shortages.

Regarding the telehealth programs in view, these are primarily nurse-driven programs. Registered nurses run the daily operations of the programs, and UMMC 2 You is primarily staffed by nurse practitioners. Understanding perceptions of telehealth for these programs directly affects nurses.

Also, advocacy is a pillar of the nursing profession (ANA, 2020). Seeking to understand patients' perception of telehealth is an extension of the nursing principal of advocacy. If patients are more open to using telehealth due to the pandemic, nurses can advocate for patients and provide crucial interventions that can remove barriers to telehealth usage.

Nurses can also provide valuable insights as they are often the first points of contact for patients (Moore & Trainum, 2019). Nurses should be driving changes and improvements in the delivery of telehealth, and this research can help nurses inform policy and practice change. Nursing is uniquely positioned to give insights into a patient's perspective and a provider's perspective into the telehealth conversation, and nurses should lead the way in effecting change in the field of telehealth.

An increase in telehealth openness also can mean that routine and follow-up care can be increasingly delivered via telehealth. Hospitals and healthcare providers should consider the increased

TABLE 7 Perception of using telehealth due to COVID-19 by age, race/ethnicity, and sex

The COVID-19 pandemic has made me more open to using telehealth		n	M	SD	SE	95% confidence interval for mean	
						Lower bound	Upper bound
Age	21-39	123	4.23	0.904	0.081	4.07	4.39
	40-65	214	3.93	1.153	0.079	3.78	4.09
	65+	29	3.69	1.391	0.258	3.16	4.22
Race/Ethnicity	White	251	3.91	1.136	0.072	3.77	4.05
	Black	95	4.29	0.977	0.100	4.10	4.49
	Other	20	4.00	1.124	0.251	3.47	4.53
Sex	Male	79	3.65	1.188	0.134		
	Female	287	4.11	1.063	0.063		

openness of patients to using telehealth as a motivator to support telehealth opportunities, especially in rural communities where access is most limited. During the pandemic, reports of families and children in Mississippi having access to specialty care are motivators to continue support of telehealth (Whitehead, 2021).

The regional constraints of only sampling participants from two Mississippi telehealth programs limit the study's scope. Future research should assess if perceptions of telehealth have changed in other states and countries. Also, other areas might have had higher acceptance of telehealth pre-pandemic. Higher acceptance would mean that the pandemic would not have necessarily increased someone's openness to telehealth.

CONCLUSION

While the COVID-19 pandemic has affected how we work, where we can go, and what we must wear, telehealth has become increasingly more available (Disruption, innovation and growth: A story of perseverance, 2021) and, as this study suggests, participants in the Southern United States have been more open to using telehealth. Investors, providers, and stakeholders should see this as a significant sign for more telehealth acceptance into the future. Diseases that spread like COVID-19 could be ripe ground for telehealth development. Telehealth visits for diseases like flu and other respiratory illnesses might receive more acceptance among patients going forward. Also, increasing telehealth usage could be leveraged to help decrease the burden on hospitals related to staffing shortages. More studies should be completed to determine COVID-19's impact on telehealth perceptions in other parts of the United States and across the world.

CLINICAL RESOURCES

- American Telemedicine Association—<https://www.americatelemed.org>

- Centers for Disease Control and Prevention COVID-19 Guidance—<https://www.cdc.gov/coronavirus/2019-ncov/index.html>
- COVID-19 Emergency Declaration Blanket Waivers for Health Care Providers—<https://www.cms.gov/files/document/covid-19-emergency-declaration-waivers.pdf>

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CONFLICT OF INTEREST

None to declare.

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INSTITUTIONAL REVIEW BOARD APPROVAL

The Institutional Review Board of the University of Mississippi Medical Center approved this study (#2020-0216).

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