Patient Satisfaction and Trust in Telemedicine during the COVID-19 Pandemic

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Submitted to: JMIR Human Factors
on: March 07, 2021

Table of Contents

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Abstract

Background: Los Angeles County is a hub for COVID-19 cases in the United States. Academic health centers rapidly deployed and leveraged telemedicine to permit uninterrupted care of patients. Telemedicine enjoys high patient satisfaction, yet little is known about the level of satisfaction during a crisis and to what extent patient or visit-related factors and trust play when in-person visits are eliminated.

Objective: To examine correlates of patients' satisfaction with a telemedicine visit.

Methods: In this retrospective observational study conducted in our single-institution, urban, academic medical center in Los Angeles, internal medicine patients aged 18 years and above who completed a telemedicine visit between March 10th and April 17th, 2020 were invited for a survey (n=1624). Measures included patient-demographics, degree of interpersonal trust in patient-physician relationships using the" Trust in Physician Scale," and visit-related concerns. Statistical analysis used descriptive statistics, Spearman rank-order correlation, and linear and ordinal logistic regression.

Results: Of 1,624 telemedicine visits conducted during this period, 368 (22.7%) patients participated in the survey. Across the study, respondents were very satisfied (47.4%) or satisfied (35.3%) with their telemedicine visit. Higher physician trust was associated with higher patient satisfaction (Spearman correlation r=0.51, P<.001). Visit-related factors with significant correlation with trust in physician score were technical issues with the telemedicine visit (r=-0.16), concerns about privacy (r=-0.19), concerns about cost (r=-0.23), satisfaction with telemedicine convenience (r=0.41), and amount of time spent (r=0.47) (all P<0.01). Visit-related factors associated with patients' satisfaction included fewer technical issues (P<.001), less concern about privacy (P<.001) or cost (P=0.02), and successful face to face video (P<.001). The only patient variable with a significant positive association was income and level of trust in physician (r=0.18, P<.001). Younger age was associated with higher satisfaction with the telemedicine visit (P=.005).

Conclusions: There have been calls for redesigning primary care after the COVID-19 pandemic and for the widespread adoption of telemedicine. Patients' satisfaction with telemedicine during the COVID-19 pandemic is high. Their satisfaction is shaped by the degree of trust in physician and visit-related factors more so than patient factors. This has widespread implications for outpatient practices and further research into visit-related factors and the patient-provider connection over telemedicine is needed. Clinical Trial: IRB Approval University of Southern California July 2020 HS-20-00479

(JMIR Preprints 07/03/2021:28589)
DOI: https://doi.org/10.2196/preprints.28589

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Conclusions: There have been calls for redesigning primary care after the COVID-19 pandemic and for the widespread adoption of telemedicine. Patients' satisfaction with telemedicine during the COVID-19 pandemic is high. Their satisfaction is shaped by the degree of trust in physician and visit-related factors more so than patient factors. This has widespread implications for outpatient practices and further research into visit-related factors and the patient-provider connection over telemedicine is needed.

Keywords:

Telemedicine; patient satisfaction; COVID-19; health services research; health policy; health care delivery; physicians; medicine.

Introduction

On March 11, 2020, the World Health Organization declared the COVID-19 outbreak as a pandemic and telemedicine, particularly video consultations, was promoted and scaled up to reduce the risk of transmission [1,2]. A few months later, Los Angeles became the county with the highest number of COVID-19 cases in the United States [3,4]. To prioritize public health, our academic health center rapidly deployed and leveraged telemedicine in response to the COVID-19 pandemic, permitting uninterrupted care of our patients [5]. We transitioned all clinic encounters as of March 16,2020 to telemedicine, defined here as synchronous video or telephone visits [6,7].

Studies have shown that telemedicine visits enjoy high patient satisfaction. Still, little is known about patient satisfaction with their primary care provider during a pandemic when patients have little choice but to seek remote care. Historically, correlates of patient satisfaction with telemedicine represent patients who have chosen that platform and thus are skewed toward a younger, female, and under-or uninsured population [10,11]. Additionally, patient satisfaction with direct-to-consumer telemedicine has been assessed with little or no previous doctor-patient relationship or coordination with the patients' primary care provider [12]. Patient trust in their provider, an essential foundation for fostering patient satisfaction, has not been well studied in this type of remote care setting [13].

Rapid implementation of telemedicine within practices has been proposed to properly care for patients during the pandemic and beyond [14,15]. With the tremendous advances in telemedicine since COVID-19, determining factors correlated with satisfaction carries widespread implications for outpatient medicine and efforts to establish a framework for satisfying telemedicine visits. These findings are crucial for providers in adopting telemedicine as an element of the patient care continuum.

We captured six weeks of telemedicine visits in our primary care practice to explore the relationship of trust and patient satisfaction during a telemedicine visit which has received little attention [16,17,18]. We examined whether patient factors, visit associated factors, and the degree of "trust in provider" contributed to a satisfying telemedicine visit. We hypothesized that patient satisfaction with a telemedicine visit would be positively related to the degree of trust in the provider, patient specific factors and ease of use of the telemedicine platform.

Methods

Kec

k Medical Center is a large academic medical center located in Los Angeles. Inpatient services are provided at our institution at Keck Medical Center and USC Verdugo Hills Hospital, while outpatient services are provided at Keck Medical Center Outpatient facilities; both institutions share the same providers.

Data Source

Upon providing informed consent, the respondent was invited to complete a questionnaire provided by electronic survey. To explore the degree to which "Trust in Physician" correlates with satisfaction with telemedicine we used a previously validated measure to assess interpersonal trust in patient-physician relationships with an eleven question" Trust in Physician Scale" [19]. Responses were

scored on a 5-point Likert scale and higher scores indicated higher levels of trust (scale range 5-55).

Telemedicine visit-related issues and concerns including cost, privacy, convenience, technical issues, and time were assessed using a five-item Likert scale. Responses ranged: 1–5 and higher scores indicated higher levels of agreement/satisfaction.

Satisfaction with the telemedicine visit was measured by questions: “I look forward to using telehealth in the future” (yes/no) and a five-item Likert scale “To what extent were you satisfied with your visit.”

Respondents were also asked several questions about their demographics and health status.

Study Population

We performed a retrospective study of patients aged 18 years and older who had one or more telemedicine visits with a provider in the internal medicine department between March 10th and April 17th, 2020. This timing corresponds with a Keck Medical Center mandate to shift the majority of outpatient care from in-person to telemedicine visits. A total of 1744 patients had an encounter with our internal medicine providers during that time and a link to a survey was successfully emailed to 1624 patients (93%). Data were collected in the fall of 2020. To be eligible to participate, the respondent had to have a telemedicine visit with one of our primary care providers. With a final sample size of 368 responders (22.7%); the attained sample size provided 80% statistical power to detect correlations of 0.14 and higher. The study database in REDCap used the survey feature; all surveys were completed anonymously, and no personal health information or personally identifiable information on survey respondents was collected, in compliance with HIPAA. Non-responders were similar in gender to responders (60.3% female vs 64.4% female), but responders were older than non-responders by an average of 4.5 years (P<.0001).

Statistical Analysis

Descriptive statistics were used to summarize visit-related concerns, patient characteristics, and satisfaction with the telemedicine visit. Variables were summarized as frequency and percentages for categorical variables and median and inter-quartile ranges (IQR) for continuous variables.

The association of the Likert-scale satisfaction item with trust in physician was evaluated with a Spearman rank-order correlation. The median (IQR) Trust in Physician score is presented by level of patient satisfaction.

Associations of patient and visit-related factors with Trust in Physician and patient satisfaction used Spearman rank-order correlation, linear regression, and ordinal logistic regression (ordinal patient satisfaction dependent variable). Patient and visit-related factors found in a linear regression analysis to be associated with the Trust in Physician score were included as independent variables to obtain an estimate and test of the adjusted association of trust with satisfaction with the telemedicine encounter.

Results

Preliminary Analysis

A link to a survey was emailed to 1624 patients with 368 respondents. The characteristics of the sample (N = 368) are described in Table 1. The sample was primarily female and white with a mean age of 55.8 years (SD 16.0 years). Respondents evaluated their current health as fair to good.

Table 1: Patient characteristics

	N (Responding)	N (%)	Median (IQR)
Age (years)	365		57 (43, 68)
Hispanic	366	96 (26.2)	
Race	348		
White		262 (70.0)	
Black or African American		25 (7.2)	
American Indian or Alaskan Native		7 (2.0)	
East Asian		28 (8.1)	
Southeast Asian		14 (4.0)	
Asian Indian		3 (0.9)	
Native Hawaiian or Pacific Islander		3 (0.9)	
Some other race		32 (9.2)	
Female	364	239 (66.0)	
Education	364		
Less than high school		10 (2.8)	
High school degree or equivalent		14 (3.9)	
Some college but not degree		67 (18.4)	
Bachelor's degree		109 (30.0)	
Graduate degree		164 (45.1)	
Current Health	365		
Excellent		46 (12.6)	
Good		196 (53.7)	
Fair		98 (26.9)	
Poor		25 (6.9)	
Income	364		
$0-$19,999		29 (8.0)	
$20,000-$39,999		17 (4.7)	
$40,000-$59,999		22 (6.0)	
$60,000-$79,999		37 (10.1)	
$80,000-$99,999		24 (6.6)	
$100,000-$119,999		21 (5.6)	
$120,000-$139,999		21 (5.6)	
$140,000-$159,999		21 (5.6)	
$160,000-$179,999		11 (3.0)	
$180,000-$199,999		13 (3.6)	
$200,000 or more		78 (21.4)	
Prefer not to answer		70 (19.2)	

Across the study, respondents were very satisfied (47.4%) or satisfied (35.3%) with their telemedicine visit, and 77% reported that they "look forward to using telehealth in the future". Table 2 describes the visit characteristics of the sample. Respondents tended not to worry about privacy or the cost of the telemedicine visit. Face to face video rather than telephone alone was preferred by the majority of respondents with 67.7% strongly agreeing/agreeing it was important. Almost one-third of patients (31.3% n= 114) had technical issues during the visit, yet 63 of them resolved during the telemedicine visit. Notably, despite technical challenges, the convenience of telehealth was supported by 55.7% of patients' who strongly agreed and 32.8% who agreed the telehealth visit was convenient. There was high satisfaction among our respondents with the amount of time spent and 90.1% (n=327) strongly agreed or agreed that the amount of time spent with the provider was adequate. Patients did not appear to have privacy concerns with 28.8% strongly disagreeing and 40% disagreeing that they were "concerned about privacy."

Table 2: Visit characteristics

	N (Responding)	N (%)	Median (IQR)
Used video with your telehealth visit	367	284 (77.4)	
Did you experience significant technical issues before or during your visit?	365		
Yes		51 (14.0)	
Yes, but it was resolved during telehealth visit		63 (17.3)	
No		251 (69.0)	
What sort of technical issues did you have?	110		
Sound was not working		13 (11.8)	
Video was not working		38 (34.5)	
I was able to connect, but via different telehealth sources		32 (39.1)	
Other issues		27 (24.6)	
The telehealth visit was convenient	366		5 (4, 5)
Strongly disagree		7 (1.9)	
Disagree		11 (3.0)	
Neither agree nor disagree		24 (6.6)	
Agree		120 (32.8)	
Strongly agree		204 (55.7)	
The amount of time spent was adequate	363		5 (4, 5)
Strongly disagree		5 (1.4)	
Disagree		9 (2.5)	
Neither agree nor disagree		22 (6.1)	
Agree		134 (36.9)	
Strongly agree		193 (53.2)	
I was concerned about privacy	365		2 (1, 3)
Strongly disagree		105 (28.8)	
Disagree		146 (40.0)	
Neither agree nor disagree		63 (17.3)	
Agree		28 (7.7)	
Strongly agree		23 (6.3)	
Having face to face video was important	359		4 (3, 5)
Strongly disagree		7 (2.0)	
Disagree		22 (6.1)	
Neither agree nor disagree		87 (24.2)	
Agree		108 (30.1)	
Strongly agree		135 (37.6)	
I was worried how much my telehealth visit would cost	363		2 (2, 3)
Strongly disagree		83 (22.9)	
Disagree		114 (31.4)	
Neither agree nor disagree		112 (30.9)	
Agree		36 (9.9)	
Strongly agree		18 (4.5)	

I look forward to using telehealth in the future	361	279 (77.3)
To what extent were you satisfied with your visit	365	
Very unsatisfied		10 (2.7)
Unsatisfied		14 (3.8)
Neutral		39 (10.7)
Satisfied		129 (35.3)
Very satisfied		173 (47.4)
Did you recover from your illness?	312	
Yes		12 (3.9)
Yes, but I required more than one telehealth visit		12 (3.9)
No, I was seen in an urgent care clinic/ER		70 (22.4)
No, I was sent to Keck Medical evaluation tent or ETC		218 (69.9)

A summary of results from respondents to the 11 point “trust in physician” scale appears in Table 3. Respondents overwhelmingly agreed they “trust my doctor’s judgments about my medical care” and that their doctor “is a real expert in taking care of medical problems.”

Table 3: Trust in Physician

	N (Responding)	N (%)	Median (IQR)
I doubt my doctor really cares about me as a person	366		1 (1, 2)
Strongly disagree		202 (55.2)	
Disagree		104 (28.4)	
Neither agree nor disagree		40 (10.9)	
Agree		8 (2.2)	
Strongly agree		12 (3.3)	
My doctor is usually considerate of my needs and puts them first	365		5 (4, 5)
Strongly disagree		7 (1.9)	
Disagree		4 (1.1)	
Neither agree nor disagree		32 (8.8)	
Agree		131 (35.9)	
Strongly agree		191 (52.3)	
I trust my doctor so much I always try to follow his/her advice	365		4 (4, 5)
Strongly disagree		6 (1.6)	
Disagree		2 (0.5)	
Neither agree nor disagree		33 (9.0)	
Agree		152 (41.6)	
Strongly agree		172 (47.1)	
If my doctor tells me something is so, then it must be true	363		4 (3, 4)
Strongly disagree		8 (2.2)	
Disagree		23 (6.3)	
Neither agree nor disagree		117 (32.2)	
Agree		153 (42.2)	
Strongly agree		62 (17.1)	
I sometime distrust my doctor's opinion and would like a second one	362		2 (2, 3)
Strongly disagree		82 (22.7)	
Disagree		152 (42.0)	
Neither agree nor disagree		85 (23.5)	
Agree		35 (9.7)	
Strongly agree		8 (2.2)	
I trust my doctor's judgements about my medical care	362		4 (4, 5)
Strongly disagree		5 (1.4)	
Disagree		3 (0.8)	
Neither agree nor disagree		25 (6.9)	
Agree		167 (46.1)	
Strongly agree		162 (44.8)	
I feel my doctor doesn't do everything he/she should for my medical care	363		2 (1, 2)
Strongly disagree		148 (40.7)	
Disagree		137 (37.7)	

Neither agree nor disagree		44 (12.1)	
Agree		24 (6.6)	
Strongly agree		10 (2.8)	
I trust my doctor to put my medical needs above all other considerations when treating my medical conditions	362		4 (4, 50
Strongly disagree		4 (1.1)	
Disagree		8 (2.2)	
Neither agree nor disagree		47 (13.0)	
Agree		151 (41.7)	
Strongly agree		152 (42.0)	
My doctor is a real expert in taking care of medical problems	363		4 (4, 5)
Strongly disagree		3 (0.8)	
Disagree		4 (1.1)	
Neither agree nor disagree		51 (14.0)	
Agree		154 (42.2)	
Strongly agree		151 (41.6)	
I trust my doctor to let me know if a mistake was made about my treatment	362		4 (4, 5)
Strongly disagree		4 (1.1)	
Disagree		8 (2.2)	
Neither agree nor disagree		54 (14.9)	
Agree		158 (43.7)	
Strongly agree		138 (38.1)	
I sometimes worry that my doctor may not keep the information we discuss totally private	365		1 (1, 2)
Strongly disagree		199 (54.5)	
Disagree		115 (31.5)	
Neither agree nor disagree		47 (12.9)	
Agree		3 (0.8)	
Strongly agree		1 (0.3)	
Physician Trust total score [a]	345		46 (42, 51)

[a] *Physician trust generated by the sum of 11 items from the physician trust survey. Total scale possible = 55; mean (SD) = 45 (6.5)*

Trust in physician and satisfaction with telemedicine visit

Higher physician trust was associated with higher patient satisfaction with the telemedicine visit. Results of the Spearman correlation indicated that there was a significant positive association between the degree of patients' trust in physician and satisfaction with their telemedicine visit (r=0.51, *P*<.001).

Patient factors and trust in physician

Overall, patient factors including age (r=-0.01, *P*=.81), level of education (r<0.01, *P*=.99), and

current health status (r=-0.01, *P*=.78) were not significantly correlated with level of trust in their physician. There was, however, a significant positive association between income and level of trust in physician (r=0.18, *P*<.001).

Visit-related factors and trust in physician
In contrast to patient factors, several visit-related factors showed a significant correlation with Trust in Physician score. Respondents who did not have technical issues (r=-0.16, *P*=.002), concerns about privacy (r=-0.19, *P*<.001), or concerns about the cost (r=-0.23, *P*<.001) had higher degree of trust in their physician. Those who agreed with face to face was important (r=0.23, *P*<.001), like the convenience (r=0.41, *P*<.001) and were satisfied with the amount of time spent (r=0.47, *P*<.001) also showed higher degree of trust in their physician.

Patient factors and satisfaction with telemedicine visit
Patient factors including gender (*P*=.67), education (*P*=.82), income (*P*=.14), and current health (*P*=.18) were not associated with satisfaction with their telemedicine visit. Age was the only significant factor associated with satisfaction, with a younger median (interquartile range, IQR) age of 54 (42, 64) in those who were very satisfied compared to median (IQR) age 60 (50, 69) in those who were unsatisfied or neutral (likelihood ratio *P=.005* with ordinal logistic regression).

Visit-related factors and satisfaction with telemedicine visit
All our visit-related factors were associated with patient satisfaction with their telemedicine visit Fewer technical issues (*P*<.001), acknowledging the convenience (*P*<.001), appreciating the amount of time spent (*P*<.001), fewer concerns about privacy (*P*<.001) and cost (*P*=.02), and successful face to face video (*P*<.001) were all significantly associated with a satisfying telemedicine visit.

Discussion

The pandemic of COVID-19 poses unique challenges to health care delivery especially for those in primary care. Patient fear surrounding COVID-19 has disrupted patients' normative expectations toward their doctors (and vice versa), creating more complex trust relationships

Prior studies have shown patients prefer telemedicine with a doctor with whom they have an established relationship. When it comes to specialist referral, trust and confidence in one's primary care provider are crucial to creating a satisfying experience [21,23].

Telemedicine, particularly video consultations, has been rapidly implemented to reduce the risk of transmission. Before this historic period, studying telemedicine satisfaction would have posed a self-selection bias which the pandemic mostly eliminated due to institutional and patient health precautions early on. Correlates of patient satisfaction aid to inform and further educate practices adopting telemedicine and the pandemic provides a unique opportunity to evaluate those visits and factors affecting satisfaction.

Patients' trust in their physician, telemedicine services, and willingness to rely on such a health service for care during a pandemic has not previously been described. Researchers have given little attention to which factors contribute to trust in a telemedicine visit; a unique situation made more difficult during the pandemic. A previously reported study on the use of telehealth visits for anticoagulation management found trust in the technology, trust in healthcare professionals, and trust in the treatment affected trust in the telemedicine service [22]. The rapid transition to telemedicine requires providers and patients to transition to a new normal that includes communicating via telephone or video. For providers, this means developing skills in building trust, counseling, empathy, "modified" physical exams, and diagnosis using the telemedicine platform. Recent suggestions on fostering human connection have focused primarily on telemental health with tips for enhancing virtual connections such as being "present," identifying needs, listening,

responding with empathy, and sharing information [24]. Empirical evidence in this area is sparse and achieving greater clarity about factors contributing to a satisfying telemedicine visit would help healthcare providers better anticipate patients' needs.

This study provides new insights into the reasons for a satisfying telemedicine visit when an established relationship with the provider or practice exists. Consistent with our hypothesis and using our patients' experience at the onset of the COVID-19 pandemic, we found that trust in physician, as assessed using the eleven-question "Trust in Physician" scale, was correlated with higher patient satisfaction in telemedicine visits. Patients who trust their doctor and try to follow his/her advice, trust their doctor's judgment about medical care, believe their doctor will let them know if a mistake was made about their treatment, as examples, were more likely to be satisfied with a telemedicine visit and wanted to use the platform again. These findings suggest a significant role in provider engagement, fostering human connection, and strengthening the patient-physician attachment. Higher physician trust was positively correlated with greater patient satisfaction with telemedicine.

Furthermore, trust in factors related to the visit, including privacy, cost, convenience, and time, was associated with higher satisfaction and higher trust in physicians. Our findings suggest that ease of use with fewer technical issues and video-enabled visits result in higher patient satisfaction and higher trust in physician. At our institution, test calls before initial sessions help evaluate the level of technological support a patient needs for the upcoming telemedicine visit.
Our findings support a role for continued improvement in training and operational issues in telemedicine.

While the study group was mostly white, high-income, and well-educated, our study did not find evidence that patient-related factors play a significant role in trust in physician or the likelihood of a satisfying telemedicine visit. Patient income was positively associated with level of trust; this association has been previously reported for in-person care, where lower physician trust is seen with lower income [21]. Our study found higher income correlated with a higher level of trust in physician and was associated with patient satisfaction with telemedicine. Consistent with prior research that shows younger patients, perhaps due to higher eHealth literacy, have higher acceptance of the telemedicine platform [25], we also found that younger age correlated with a satisfying telemedicine visit.

This study has several limitations. First, this is a retrospective study with no comparison to in-person visit satisfaction during the same period. Patients were not provided with that option, and we did not utilize telemedicine widely in our practice before the pandemic. Second, the use of a web-based survey prevents us from recruiting patients without an email address (7%), potentially leading to bias toward respondents with higher digital literacy. Third, respondents were significantly older than our non-responders (55.8 years vs. 51.3 years p<.0001), yet while our findings support younger age as a factor correlated with satisfaction with their visit, age was not correlated with trust in physician. Lastly, as our study population was less ethnically and racially diverse than the overall United States and Los Angeles County population, we could not capture underrepresented minorities and underserved communities' experiences.

In conclusion, the present study suggests most patients are satisfied with telemedicine visits during the COVID-19 pandemic and that trust in physician correlates favorably with patient satisfaction. Trust and satisfaction are shaped by many visit-related factors, including convenience, time spent, and video-enabled encounters rather than specific patient-related factors. Our study reinforces telemedicine as a new form of health care delivery even in times of uncertainty supporting our hypothesis that patient satisfaction with a telemedicine visit would be positively related to the degree

of trust in the provider and ease of use of the telemedicine platform. Further studies examining patient-physician relationships over telemedicine may better understand elements contributing to patients' trust in their physicians. With calls to promote and scale-up telemedicine in primary care, this will help develop a strategy and operational plans for providers to switch to remote patient care.

Conflicts of Interest

The authors have no conflict-of-interest disclosures related to this work.

Acknowledgement

This work was supported by grants UL1TR001855 and UL1TR000130 from the National Center for Advancing Translational Science (NCATS) of the U.S. National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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