

Telemedicine Versus Teledermatology Usage and Perception Among US-Based Physicians: A Survey Study

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ABSTRACT

The COVID-19 pandemic has sparked an increase in focus and use of telemedicine in several patient care settings. This survey study was distributed to actively practicing US-based physicians and examines telehealth use 2 years after the beginning of the COVID pandemic from a physician's perspective. Notable findings include telehealth benefits which include increased patient access and the ability to work from home. A continued drawback in telehealth visits is the limitations on a complete physical examination, a drawback that was emphasized by the dermatology community. While this study sheds light on the developing nature of telehealth, it is limited by its retrospective nature and sample size. Future research with larger sample sizes focusing on economic incentives and telemedicine training may help to overcome barriers to using telehealth.

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INTRODUCTION

The COVID-19 pandemic catalyzed a significant shift in patient care marked by increased telemedicine use.¹ Studies have described not only the perception, usage, and implementation of teledermatology but also the variation around telemedicine adoption based on physician and patient demographics.²⁻⁵ However, few studies have quantified physicians' perspectives of telemedicine especially across multiple specialties and regions of the US. This study serves as an update to prior research by examining the implementation of telemedicine among US-based physicians several years after the COVID-19 pandemic began.

MATERIALS AND METHODS

A pre-validated anonymous survey was distributed to open social networking groups comprised of actively practicing US-based physicians. Categorical data was analyzed via SPSS (version 28.0.0) using chi-square based upon years in practice, practice type, specialty (surgical versus non-surgical, dermatologist versus non-dermatologist), and region of the US to assess the appropriateness of telemedicine and modalities used (eg, phone, store-and-forward (SAF), video, video with image). If the results were significant, adjusted residuals were determined. For Likert scale questions, results were analyzed using the Mann-Whitney U test.

TABLE 1.

Demographics of Respondents			
Total Number of Respondents; n=95		Frequency	% of Total
Setting	Academic/ University	58	61%
	Private Practice	25	26%
	Other	12	13%
Years in Practice	1 – 10 years	37	39%
	11 – 20 years	31	33%
	21 – 30 years	9	9%
	31+ years	5	5%
	Current resident/fellow	13	14%
U.S. Region*	Midwest	17	18%
	Northeast	41	43%
	South	22	23%
	West	15	16%
Specialty**	Surgical	20	21%
	Non-Surgical	75	79%
Specialty (Derm vs Non-Derm)	Dermatology	20	21%
	Not Dermatology	68	72%
Timeline of Telemedicine Adoption	Pre-COVID	23	24%
	Post-COVID	65	68%
	Never adopted telemedicine	7	7%

* Based on U.S. Census Bureau delineation

** Surgical specialties included: anesthesiology, general surgery, obstetrics & gynecology, ophthalmology, otolaryngology, plastic surgery, urology. Nonsurgical: dermatology, diagnostic radiology, emergency medicine, family medicine, internal medicine, neurology, pediatrics, and psychiatry.

RESULTS AND DISCUSSION

Data from 95 practicing US-based physicians were analyzed (Table 1). When compared across US regions, physicians from the South and West reported using telehealth significantly more pre-COVID-19; in contrast, a significantly higher proportion of physicians from the Northeast reported never using telemedicine pre-COVID-19 ($\chi^2(6, n=95)=19.97$, $P=0.003$). No significant relationship existed between the time period of telemedicine implementation and years of practice ($\chi^2(8, n=95)=9.954$, $P=0.268$; Table 2).

Physicians with 21-30 years of independent practice were significantly more likely to desire an in-person visit at some point during care of their patients, whereas current residents were significantly more likely to report that telemedicine alone for patient care was acceptable ($\chi^2(4, n=88)=12.53$, $P=0.014$). Furthermore, physicians with 30+ years of practice were significantly more likely to report that 0-20% of their total telemedicine visits were appropriate for telemedicine ($\chi^2(20, n=88)=41.88$, $P=0.003$; Table 3).

Telemedicine modality did not vary significantly based on years in practice ($\chi^2(12, n=88)=16.600$, $P=0.165$), surgical versus non-surgical specialty ($\chi^2(3, n=88)=1.734$, $P=0.629$), US region ($\chi^2(9, n=88)=16.782$, $P=0.052$), or setting ($\chi^2(6, n=88)=4.908$, $P=0.556$). However, dermatologists were more likely to use the SAF modality compared to all other specialties combined (Table 4).

The highest-ranked advantages of telemedicine overall included the ability to work from home, schedule flexibility, and patient preference/access (Table 5). Notably, when stratified based on the timepoint of telemedicine adoption, physicians who adopted it pre-COVID rated higher financial compensation, decreased overhead costs, and ability to observe patients in a home environment as advantages of telemedicine. Dermatologists assigned significantly lower scores to these perceived

TABLE 2.

Teledermatology/Telemedicine Adoption Time Point Relative to COVID-19 Stratified by Respondent Demographics				
US Region (N, %)	Post-COVID19	Pre- COVID-19	Never Used	P-Value
Midwest	15 (16)	1 (1)	1 (1)	$P=0.003$ $\chi^2(6, n=95)=29.972$
Northeast	30 (32)	5 (5)	6 (6)	
South	12 (13)	10 (11)	0 (0)	
West	8 (8)	7 (7)	0 (0)	
Years in Practice (N, %)	Post-COVID19	Pre- COVID-19	Never Used	P-Value
1-10 Years	28 (29)	7 (7)	2 (2)	$P=0.268$ $\chi^2(8, n=95)=9.954$
11-20 Years	21 (22)	9 (9)	1 (1)	
21-30 Years	6 (6)	3 (3)	0 (0)	
31+ Years	2 (2)	2 (2)	1 (1)	
Current resident/fellow	8 (8)	2 (2)	3 (3)	

TABLE 3.

Current Teledermatology/Telemedicine Implementation Stratified by Years of Practice Experience					
US Region (N, %)	1-10	11-20	21-30	31+	Current Resident/ Fellow
Would you be ok only seeing a patient only by telemedicine or would you require an in-person visit at some point during care?					
In-Person visit would be required	18	21	9	3	3
Telemedicine only is acceptable	17	9	0	1	7
P-Value	P=0.014 $\chi^2(4,n=88)=12.53$				
What % of your total telemedicine visits would you estimate as appropriate for telemedicine?					
0-20%	6	7	2	3	1
21-40%	6	9	3	0	0
41-60%	5	3	0	0	3
61-80%	9	3	1	0	2
81-100%	9	8	3	0	4
P-Value	P=0.003 $\chi^2(20,n=88)=41.880$				
What % of non-procedural patient interactions are currently done with telemedicine?					
0-20%	20	20	4	4	2
21-40%	7	5	4	0	2
41-60%	3	1	0	0	0
61-80%	1	0	0	0	2
81-100%	4	4	1	0	4
P-Value	P=0.065 $\chi^2(16,n=88)=25.269$				

TABLE 4.

Stratification of Teledermatology/Telemedicine Modalities Used by Respondent Demographics					
Telemedicine Modality	Phone	Store-and-Forward	Video	Video with Image	P-Value
Years in Practice					
1-10 Years	7	3	25	0	P=0.165 $\chi^2(12,n=88)=16.600$
11-20 Years	6	0	24	0	
21-30 Years	2	0	6	1	
31+ Years	1	1	2	0	
Current resident/fellow	2	0	8	0	
US Region (N, %)					
Midwest	6	0	9	1	P=0.052 $\chi^2(9,n=88)=16.782$
Northeast	3	3	29	0	
South	3	1	18	0	
West	6	0	9	0	
Specialty					
Surgical	6	1	13	0	P=0.629 $\chi^2(3,n=88)=1.734$
Non-Surgical	12	3	52	1	
West	6	0	9	0	
Setting					
Academic/University	13	3	35	1	P=0.556 $\chi^2(6,n=88)=4.908$
Private Practice	3	0	22	0	
Other	2	1	8	0	
Specialty (Dermatology)					
Dermatology	3	3	13	1	P=0.016 $\chi^2(3,n=88)=10.275$
Non-Dermatology	15	1	52	0	

TABLE 5.

Reponses to Likert scale questions**						
	Pre-COVID (N=23)	Post-COVID (N=65)	P-Value	Derm (N=20)	Non-Derm (N=68)	P-Value
	Mean (St Dev)	Mean (St Dev)		Mean (St Dev)	Mean (St Dev)	
On a scale from 1-5 please with 5 being the most advantageous, rank the following in terms of how advantageous they are for you to implement telemedicine in your practice?						
Scheduling flexibility	4.48 (0.59)	4.12 (0.96)	0.171	3.55 (1.10)	4.41 (0.72)	<0.001*
Ability to work from home/work remotely	4.65 (0.57)	4.20 (1.24)	0.252	3.30 (1.38)	4.62 (0.83)	<0.001*
Additional/increased financial compensation	3.17 (1.15)	2.58 (1.00)	0.028*	2.20 (1.15)	2.90 (0.99)	0.006*
Patient preference/access	4.39 (0.94)	4.08 (0.96)	0.071	3.60 (1.27)	4.32 (0.78)	0.013*
Increase access to specialty referrals	4.00 (1.00)	3.26 (1.23)	0.016*	2.70 (1.26)	3.68 (1.11)	0.003*
Decreased overhead costs	3.91 (1.08)	3.06 (1.17)	0.002*	2.20 (1.11)	3.60 (1.04)	<0.001*
Decreased exposure to pathogens	4.00 (1.13)	3.71 (1.22)	0.312	2.80 (1.36)	4.07 (0.98)	<0.001*
More relaxed patient encounters/ability to observe patients in home environment	4.04 (1.22)	3.02 (1.41)	0.002*	1.85 (1.14)	3.71 (1.22)	<0.001*
On a scale from 1-5 please with 5 being the greatest barrier, please rank the following in terms of how large of a barrier they are for you to implement telemedicine in your practice?						
Technological barriers to access	3.61 (1.37)	3.54 (1.19)	0.631	3.10 (1.65)	3.69 (1.05)	0.225
HIPAA compliance concerns	2.09 (1.16)	2.40 (1.14)	0.231	1.95 (1.00)	2.43 (1.18)	0.118
Concerns about reimbursement	3.30 (1.33)	3.58 (1.24)	0.362	3.40 (1.10)	3.54 (1.31)	0.488
Financial concerns about investing in a platform	2.91 (1.31)	2.28 (1.21)	0.043*	1.96 (0.94)	2.59 (1.31)	0.055
Issues with medical licensing/credentialing	2.74 (1.42)	2.68 (1.28)	0.922	2.50 (1.32)	2.75 (1.31)	0.527
Malpractice/risk of liability	2.68 (1.25)	2.77 (1.30)	0.805	2.35 (1.50)	2.87 (1.19)	0.085
Insufficient training with telemedicine	2.43 (1.20)	2.18 (1.20)	0.371	2.10 (1.21)	2.29 (1.20)	0.482
Limitations to patient assessments, physical exams	3.52 (1.24)	4.15 (1.12)	0.014*	4.80 (0.89)	3.75 (1.15)	<0.001*
For the following, select a number between 1-5 (1-2 disagree, 3 neutral, 4-5 agree) depending on how much you agree with the statement.						
Telemedicine has improved my patient's access to care (after-hours visits, reduced wait times, urgent/emergent care).	4.52 (0.90)	4.02 (0.94)	0.004*	3.35 (1.18)	4.38 (0.73)	<0.001*
I enjoy using telemedicine.	4.57 (0.95)	3.68 (1.24)	<0.001*	2.70 (1.17)	4.26 (1.00)	<0.001*
Telemedicine is exhausting.	2.39 (1.23)	2.80 (1.18)	0.129	3.40 (1.39)	2.49 (1.06)	0.007
My telemedicine clinic is more efficient than my in-person clinic.	3.70 (1.26)	3.17 (1.39)	0.135	1.95 (1.10)	3.71 (1.17)	<0.001*
I prefer to see patients in person.	2.96 (1.30)	3.58 (1.18)	0.042*	4.75 (0.55)	3.03 (1.11)	<0.001*
I would continue to use telemedicine if reimbursement rates decreased.	2.83 (1.34)	2.46 (1.34)	0.244	1.80 (0.89)	2.78 (1.37)	0.005
I would continue to use telemedicine if reimbursement rates decreased.	2.83 (1.34)	2.46 (1.34)	0.244	1.80 (0.89)	2.78 (1.37)	0.005

* P-Value<0.05

** Mann-Whitney U test performed given non-normally distributed data

advantages. Results did not vary based on surgical versus non-surgical specialties. Across all respondents, the highest-ranked barriers to telemedicine included limitations to patient assessments/physical exams, technological barriers to access, and concerns about reimbursement. Dermatologists were significantly more likely to rate limitations to physical exams as the largest barrier. Among non-adopters, technological barriers and insufficient training were noted as challenges to telemedicine adoption.

Telemedicine has had significant implications for patient care after its wide adoption after the COVID-19 pandemic.⁶⁻⁸ Our study suggests that physicians who started using telemedicine before versus after the pandemic varied based on the US region, with the South and West leading in its use before the pandemic began. This suggests that there may have been utility in telemedicine use in rural areas of the country with broadband access but a larger physical distance from clinic sites. Furthermore, the length of practice was associated with significant differences

in preferences for telemedicine use, with more experienced physicians desiring in-person contact for patient care. This suggests that younger physicians may be more likely to use and prefer telemedicine, which could implicate the future growth of telemedicine as it shapes the future landscape of medical practice. Our study also suggests that dermatologists' largest concern with telemedicine is its physical exam limitations, which is consistent with prior research.³

Limitations to this study include its retrospective nature and limited sample size, though data represented multiple geographic locations, years of practice, and practice settings. Future studies resulting in economic incentives and telemedicine training may help to overcome barriers to using telehealth.

DISCLOSURES

JWM, JB, RB, JD, NK, CK, LS, BM, AO, and NY are 2021-2022 Telehealth Fellow with Doximity, Inc. JWM, RB, JD, NK, and AO have served as advisory board member for Doximity, Inc. MA, GHL, DZ, SP, and DSR have no relevant conflicts of interest or disclosures.

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