

Telehealth Utilization During the COVID-19 Pandemic Among People With Functional Disabilities in the U.S.: A Preliminary Analysis of National Health Interview Survey 2020 Data



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Introduction: Telehealth has been widely promoted and adopted at multiple levels in the U.S. healthcare system during the COVID-19 pandemic. However, this rapid expansion of telehealth services may have further exacerbated health inequities among marginalized groups.

Methods: Using the 2020 National Health Interview Survey, this study compared patterns of telehealth use between people with functional disabilities and people without disabilities during the first year of the pandemic.

Results: In the multivariable-adjusted logistic regression models, respondents with moderate disabilities were significantly more likely to report telehealth use, not pandemic related (OR=1.25, 95% CI=1.03, 1.52) and telehealth use, pandemic related (OR=1.43, 95% CI=1.28, 1.60) than people without disabilities. Similarly, respondents with severe disabilities were significantly more likely to report telehealth use, not pandemic related (OR=1.46, 95% CI=1.07, 2.00) and telehealth use, pandemic related (OR=2.06, 95% CI=1.72, 2.46). In addition, telehealth use varied by the number of limitations and disability type.

Conclusions: People with functional disabilities were more likely to report telehealth use than people without disabilities. Furthermore, these associations strengthened with increasing disability severity and number of limitations while varying by disability type. Additional studies are warranted to explore ways of providing patient-centered telehealth to responsively meet various healthcare needs of people with functional disabilities and improve their health outcomes.

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INTRODUCTION

Approximately 61 million U.S. adults are living with at least 1 functional disability.¹ Most of these are older adults aged ≥ 65 years living with other chronic conditions such as obesity, diabetes, and heart diseases.¹ Owing to their complex healthcare needs and vulnerability to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), people with functional disabilities

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(PWDs) were disproportionately affected by disrupted access to care during the coronavirus disease 2019 (COVID-19) pandemic (pandemic).² For example, a recent study showed that PWDs were at greater risk of COVID-19–related mortality owing to their underlying health conditions.³ They also faced more significant COVID-19–related delays in or forgone medical care in the first year of the pandemic.⁴ With the pandemic, telehealth has been widely promoted and adopted at multiple levels in the U.S. healthcare system as an alternative to limited in-person healthcare services, allowing healthcare to be delivered remotely without any COVID-19 safety concerns for both patients and providers.⁵

Although telehealth services were becoming increasingly available in the past 2 decades and at least half of the participants in recent surveys indicated that they were willing to use telehealth, the telehealth use rate was still low among U.S. physicians and the general population before the pandemic.^{5,6} Suddenly, unprepared healthcare providers and individual patients were shoved into telehealth to respond to the pandemic. This rapid expansion of telehealth services may have further exacerbated health inequities among marginalized groups (e.g., digital divide).⁷ Because PWDs have lower awareness and utilization of certain health information technology devices,⁸ research regarding how changes in the ubiquity of telehealth have impacted PWDs is warranted. To partially address this gap, this study compared patterns of telehealth use between PWDs and people without disabilities (PWODs) during the first year of the pandemic.

METHODS

Study Sample

Nationally representative data were extracted from the 2020 National Health Interview Survey, which covered civilian non-institutionalized individuals in the U.S. National Health Interview Survey used a multistage sampling framework, and the data were mostly collected by telephone in 2020 owing to the ongoing COVID-19 pandemic.⁹ The final response rate for the 2020 adult sample was 48.9%.⁹ Our final analytic sample only included respondents aged ≥ 18 years who had information on all measures of interest and were interviewed between July and December 2020.

Measures

The following 2 questions were used to identify a multinomial outcome measure of telehealth use within the past year (no use; telehealth use, not pandemic related [TUNPR]; telehealth use, pandemic related [TUPR]): (1) *In the past 12 months, have you had an appointment with a doctor, nurse or other health professional by video*

or by phone? and (2) *Were any of your appointments done by video or by phone because of reasons related to the coronavirus pandemic?* Following previous studies, we created 3 disability-related independent variables (disability severity [none, moderate, severe], number of disabling limitations [0, 1, 2, ≥ 3], and disability type [none, hearing limitation only, vision limitation only, cognitive limitation only, mobility/complex activity limitation only, and ≥ 2 limitations]).^{4,10}

To control for potential confounding factors, this analysis included sociodemographic characteristics (age [18–49, 50–64, ≥ 65 years], sex, race/ethnicity [non-Hispanic White, non-Hispanic Black, Hispanic, other], marital status, education, family income based on federal poverty line, census region, and urban/rural), health-related variables (smoking status, drinking status, general health status, number of chronic conditions [including hypertension, cardiovascular diseases, diabetes, chronic lung disease, and cancer]), usual source of care, and health insurance coverage status.

Statistical Analysis

We first compared disability status by telehealth use using chi-square tests. We then constructed 6 separate series of multivariable multinomial logistic regression models controlling for the aforementioned sociodemographic and health-related characteristics to investigate the associations between disability status and telehealth use. To account for the complex survey design of the data, we performed all analyses with survey procedures and recommended sampling weights in SAS, version 9.4 (SAS Institute, Cary, NC). Statistical significance testing was 2-sided with $\alpha=0.05$. The data set is deidentified and publicly available. Thus, this study was deemed exempt from review by the IRB of the University of North Florida. This study followed the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies guidelines.

RESULTS

Our sample included 17,533 respondents (representing 249,976,968 U.S. adults), comprising 32.0% with moderate and 8.8% with severe disabilities. Percentages of TUNPR and TUPR were significantly different (Table 1, all $p<0.001$) by disability severity (none versus moderate versus severe: 4.7% vs 6.1% vs 7.4% and 21.7% vs 32.1% vs 45.5%, respectively), number of limitations (1 vs 2 vs ≥ 3 : 4.7% vs 6.0% vs 5.3% and 29.2% vs 35.3% vs 47.5%, respectively), and disability type (with the highest prevalence among people with multiple limitations: 6.7% and 41.0%, respectively).

Table 1. Respondents' Functional Disability Status by Telehealth Utilization in the First Year of the COVID-19 Pandemic

Disability status ^b	n	Weighted n	Telehealth use ^a % (95% CI)			p-value
			No use	Telehealth use, not COVID-19 pandemic related	Telehealth use, COVID-19 pandemic related	
Disability severity						
None	9,652	148,041,059	73.6 (72.4, 74.8)	4.7 (4.2, 5.2)	21.7 (20.6, 22.9)	<0.001
Moderate	6,143	80,052,573	61.8 (60.1, 63.5)	6.1 (5.2, 6.9)	32.1 (30.5, 33.8)	
Severe	1,738	21,883,336	47.0 (43.8, 50.3)	7.4 (5.8, 9.1)	45.5 (42.2, 48.8)	
Disability, by number of limitations						
None	9,652	148,041,059	73.6 (72.4, 74.8)	4.7 (4.2, 5.2)	21.7 (20.6, 22.9)	<0.001
1 limitation	3,916	51,589,033	64.8 (62.8, 66.8)	6.0 (5.1, 7.0)	29.2 (27.3, 31.0)	
2 limitations	2,009	26,768,338	59.5 (56.5, 62.4)	5.3 (4.0, 6.5)	35.3 (32.3, 38.2)	
≥3 limitations	1,956	23,578,537	44.2 (41.1, 47.2)	8.3 (6.6, 10.1)	47.5 (44.5, 50.5)	
Disability, by type of limitation						
None	9,652	148,041,059	73.6 (72.4, 74.8)	4.7 (4.2, 5.2)	21.7 (20.6, 22.9)	<0.001
Hearing, only	941	11,176,905	66.4 (62.5, 70.4)	5.9 (4.0, 7.7)	27.7 (23.9, 31.5)	
Vision, only	981	14,346,600	72.5 (68.9, 76.1)	5.1 (3.3, 7.0)	22.4 (19.2, 25.5)	
Cognitive, only	810	12,027,708	64.0 (59.4, 68.5)	5.7 (3.8, 7.7)	30.3 (26.1, 34.5)	
Mobility/complex activity, only	1,184	14,037,820	56.4 (52.8, 60.1)	7.2 (5.3, 9.2)	36.3 (32.9, 39.7)	
≥2 limitations	3,965	50,346,875	52.3 (50.2, 54.4)	6.7 (5.6, 7.8)	41.0 (38.9, 43.1)	

Note: All analyses were conducted using SAS 9.4 (Cary, NC), adjusting for the complex survey design and sampling weights.

^aTelehealth use was derived using 2 questions: (1) *In the past 12 months, have you had an appointment with a doctor, nurse, or other health professional by video or by phone?* and (2) *Were any of your appointments done by video or by phone because of reasons related to the coronavirus pandemic?*

^bFunctional disability status was derived using 6 questions: (1) Do you have difficulty seeing even when wearing glasses or contact lenses?; (2) Do you have difficulty hearing even when using your hearing aid(s)?; (3) Do you have difficulty remembering or concentrating?; (4) Do you have difficulty walking or climbing steps?; (5) Do you have difficulty with self-care, such as washing all over or dressing?; (6) Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?

In the multivariable-adjusted logistic regression models (Table 2), respondents with moderate disabilities were significantly more likely to report TUNPR (OR=1.25, 95% CI=1.03, 1.52) and TUPR (OR=1.43, 95% CI=1.28, 1.60) than PWDs. Similarly, respondents with severe disabilities were significantly more likely to report TUNPR (OR=1.46, 95% CI=1.07, 2.00) and TUPR (OR=2.06, 95% CI=1.72, 2.46). Other significant predictors of telehealth use included age, sex, education attainment, residing in urban or rural areas, having a usual source of care and insurance coverage, self-reported health status, and the number of chronic conditions.

In addition, Table 3 shows that people with 1 limitation (TUNPR: OR=1.26, 95% CI=1.02, 1.57; TUPR: OR=1.32, 95% CI=1.17, 1.48) and ≥3 limitations (TUNPR: OR=1.81, 95% CI=1.34, 2.45; TUPR: OR=2.36, 95% CI=1.99, 2.79) were significantly more likely to report TUNPR and TUPR. Finally, respondents with mobility/complex activity limitations (OR=1.40, 95% CI=1.00, 1.95) or ≥2 limitations (OR=1.34, 95% CI=1.06, 1.71) were more likely to report TUNPR, whereas people with hearing limitation (OR=1.28, 95%

CI=1.02, 1.59), cognitive limitation (OR=1.55, 95% CI=1.25, 1.93), mobility/complex activity limitation (OR=1.52, 95% CI=1.26, 1.84), or ≥2 limitations (OR=1.87, 95% CI=1.63, 2.14) had significantly higher odds of TUPR.

DISCUSSION

We found that PWDs were more likely to report both TUNPR and TUPR than PWDs. Furthermore, these associations were strengthened with increasing disability severity and number of limitations while varying by disability type. According to Andersen's Behavioral Model of Health Services Use, need, predisposing, and enabling factors significantly determine an individual's healthcare utilization.^{11,12} The higher prevalence of poor health outcomes and elevated healthcare needs among PWDs may be the driving forces of telehealth use for this population during the pandemic.¹³ Furthermore, consistent with a previous study in other healthcare settings,¹⁴ the highest telehealth use among the vulnerable group of PWDs for those who had more severe disability or

Table 2. Multivariable Logistic Regression Model of the Relationship Between Functional Disability Severity and Telehealth Utilization in the First Year of the COVID-19 Pandemic

	Telehealth use, not COVID-19 pandemic related (versus no use)			Telehealth use, COVID-19 pandemic related (versus no use)				
	OR	95% CI	p-value	OR	95% CI	p-value		
Disability severity								
None	1.00			1.00				
Moderate	1.25	1.03	1.52	0.022	1.43	1.28	1.60	<0.001
Severe	1.46	1.07	2.00	0.017	2.06	1.72	2.46	<0.001
Age group, years								
18–49	1.00			1.00				
50–64	1.00	0.80	1.24	0.980	0.90	0.80	1.02	0.101
≥65	1.32	1.02	1.71	0.036	0.78	0.69	0.88	<0.001
Sex								
Male								
Female	1.50	1.28	1.76	<0.001	1.54	1.40	1.68	<0.001
Race/ethnicity								
NH White	1.00				1.00			
NH Black	0.90	0.67	1.22	0.505	0.95	0.81	1.11	0.510
Hispanic	1.15	0.83	1.61	0.403	0.94	0.80	1.10	0.444
Other	1.05	0.75	1.48	0.777	0.79	0.67	0.94	0.007
Marital status								
Married	1.00				1.00			
Single	1.10	0.91	1.33	0.339	0.92	0.84	1.02	0.125
Other	1.23	0.92	1.64	0.158	0.99	0.84	1.18	0.919
Education								
Less than high school	1.00				1.00			
High school graduate	0.85	0.63	1.16	0.311	1.34	1.10	1.64	0.004
Some college/associate degree	1.03	0.77	1.38	0.860	1.77	1.45	2.15	<0.001
College graduate	1.34	0.98	1.84	0.069	2.24	1.82	2.76	<0.001
Family FPL								
>400%	1.00				1.00			
200%–400%	0.98	0.80	1.19	0.813	0.94	0.83	1.07	0.338
<200%	0.94	0.72	1.21	0.610	0.96	0.83	1.11	0.608
Census region								
Northeast	1.00				1.00			
Midwest	0.75	0.56	1.00	0.052	0.71	0.60	0.83	<0.001
South	0.93	0.71	1.21	0.586	0.72	0.62	0.83	<0.001
West	1.24	0.93	1.65	0.139	0.96	0.83	1.11	0.589

(continued on next page)

Table 2. Multivariable Logistic Regression Model of the Relationship Between Functional Disability Severity and Telehealth Utilization in the First Year of the COVID-19 Pandemic (*continued*)

	Telehealth use, not COVID-19 pandemic related (versus no use)			Telehealth use, COVID-19 pandemic related (versus no use)				
	OR	95% CI	p-value	OR	95% CI	p-value		
Urban/rural								
Large central metro	1.00			1.00				
Large fringe metro	0.86	0.68	1.09	0.221	0.83	0.72	0.96	0.012
Medium/small metro	0.74	0.57	0.95	0.019	0.73	0.64	0.83	<0.001
Nonmetropolitan	0.67	0.49	0.90	0.009	0.45	0.38	0.54	<0.001
Usual source of care								
Yes	1.00			1.00				
No	0.42	0.29	0.61	<0.001	0.34	0.26	0.44	<0.001
Insurance coverage								
Yes	1.00			1.00				
No	0.40	0.27	0.59	<0.001	0.47	0.37	0.60	<0.001
Ever smoker								
Yes	1.00			1.00				
No	0.92	0.76	1.10	0.337	0.90	0.82	0.99	0.023
Drinking status								
Never	1.00			1.00				
Former	1.12	0.82	1.53	0.468	1.45	1.21	1.75	<0.001
Current	1.12	0.83	1.49	0.461	1.27	1.07	1.51	0.006
Health status								
Excellent	1.00			1.00				
Incredibly good	0.98	0.76	1.27	0.885	1.29	1.13	1.47	<0.001
Good	1.18	0.89	1.55	0.252	1.76	1.52	2.05	<0.001
Fair/poor	1.73	1.25	2.40	0.001	2.58	2.13	3.13	<0.001
Number of chronic conditions								
0	1.00			1.00				
1	1.63	1.32	2.01	<0.001	1.57	1.39	1.76	<0.001
≥2	1.60	1.26	2.04	<0.001	2.10	1.83	2.42	<0.001

Note: All analyses were conducted using SAS 9.4 (Cary, NC), adjusting for the complex survey design and sampling weights. NH, non-Hispanic.

Table 3. Selected Results: From the Multivariable Logistic Regression Models of the Relationship Between Functional Disability (by Number of Limitations and Type of Limitations) and Telehealth Utilization in the First Year of the COVID-19 Pandemic

Disability status	Telehealth use, not COVID-19 pandemic related (versus no use)		Telehealth use, COVID-19 pandemic related (versus no use)	
	OR ^a (95% CI)	p-value	OR ^a (95% CI)	p-value
Disability, by number of limitations				
None	1.00		1.00	
1 limitation	1.26 (1.02, 1.57)	0.034	1.32 (1.17, 1.48)	<0.001
2 limitations	1.06 (0.79, 1.42)	0.709	1.56 (1.33, 1.85)	<0.001
≥3 limitations	1.81 (1.34, 2.45)	<0.001	2.36 (1.99, 2.79)	<0.001
Disability, by type of limitation				
None	1.00		1.00	
Hearing, only	1.22 (0.84, 1.77)	0.288	1.28 (1.02, 1.59)	0.030
Vision, only	1.08 (0.71, 1.63)	0.722	0.98 (0.80, 1.21)	0.864
Cognitive, only	1.36 (0.91, 2.02)	0.130	1.55 (1.25, 1.93)	<0.001
Mobility/complex activity, only	1.40 (1.00, 1.95)	0.050	1.52 (1.26, 1.84)	<0.001
≥2 limitations	1.34 (1.06, 1.71)	0.016	1.87 (1.63, 2.14)	<0.001

Note: All analyses were conducted using SAS 9.4 (Cary, NC), adjusting for the complex survey design and sampling weights.

^aAdjusted for age, sex, race/ethnicity, marital status, education, family poverty level, census region, urbanization, usual source of care, insurance coverage, smoking status, drinking status, health status, and number of chronic conditions.

multiple disabilities was likely related to their worse health status (i.e., more chronic conditions) and more healthcare needs. Nevertheless, literature has also shown that PWDs reported more unmet needs for care during the pandemic,^{4,15} suggesting that more frequent telehealth utilization for PWDs has not reduced health disparities or improved health outcomes for this group. This also raises concerns regarding the use of telehealth for PWDs without appropriately considering and responding to their unique constellation of needs in its design, implementation, and policy context.³

Our study shows that people with mobility/complex activity only and ≥2 limitations were more likely to report both TUNPR and TUPR. The higher prevalence of telehealth use among PWDs during the COVID-19 pandemic may also be related to their telehealth use behaviors before the pandemic. Previous studies show that individuals with mobility/complex activity limitations were satisfied with telehealth before the pandemic primarily owing to its convenience and affordability while avoiding transportation barriers.^{16,17} Their positive experiences in telehealth use may have allowed them to adapt more quickly to a broader telehealth adoption environment during the pandemic than PWDs. In addition, the relaxed telehealth regulations and broadened telehealth availability for Medicare beneficiaries and PWDs during the COVID-19 emergency,^{5,18} the fear of contracting the virus due to the greater risk of COVID-19 infection and related mortality, and reduced transportation and in-person healthcare service availability secondary to pandemic restriction measures and other mitigation-related policies ultimately created another large driving force of telehealth use among some PWD subgroups. Nevertheless, policymakers and healthcare providers should carefully assess the impacts of this telehealth use spike (i.e., quality of care, service parity, and payment parity) that was passively shaped by the COVID-19 emergency on health outcomes for both PWDs and PWDs.

In addition, we found that being younger, being female, having higher educational attainment, living in urban areas, having insurance coverage, and having a usual source of care were significantly associated with higher likelihoods of TUPR among PWDs regardless of disability severity level. Potential explanations include having better access to technology such as computers and high-speed internet, which are essential for receiving telehealth services (i.e., younger groups and urban residents),^{19,20} having more health and/or telehealth-related knowledge and being more willing to adopt new technology (i.e., women and people with higher education attainment),^{21,22} and having more enabling factors for healthcare utilization in general (i.e., those with insurance coverage and having a usual source of

care).^{11,12} This further suggests that the current one-size-fits-all approach to telehealth may exacerbate health disparities for certain subgroups of PWDs. Thus, additional studies are warranted to explore ways of providing patient-centered telehealth to responsively meet various healthcare needs of PWDs and improve their health outcomes.

Limitations

Our study has several limitations. First, the development of the pandemic and its related restriction measures varied at the state and local levels. Our models only controlled for census regions in the analyses owing to data availability. Furthermore, the telehealth-related policies and eligibility also varied by insurance plans and geographic locations in the early stage of the pandemic. This may also affect telehealth use behaviors across different subpopulations. Second, self-reported telehealth use may be subject to recall bias. The self-reported disability status may also have resulted in the misclassification of PWDs and PWOds. Third, the lack of information about the sources of the disability (i.e., whether patients require specialty services) and types of appointments (i.e., general or specialty medical care) may also affect telehealth use. Finally, our study could not account for respondent vaccination status, telemedicine modality (e.g., phone, videoconferencing), and provider factors, which may affect telehealth use behaviors.

CONCLUSIONS

PWDs were more likely to report telehealth use than PWOds. Furthermore, these associations strengthened with increasing disability severity and number of limitations while varying by disability type. Additional studies are warranted to examine the influences of the potential confounders on telehealth use behaviors and explore ways of providing patient-centered telehealth to responsively meet various healthcare needs of PWDs and improve their health outcomes.

DECLARATION OF INTEREST

None.

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