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# People with Disabilities Online Engagement During COVID-19

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## Abstract

The COVID-19 pandemic led to a rapid increase of online engagement. High levels of online engagement continue across different contexts including ordering food and meals, telehealth, and working remotely in the United States. This study examines these behaviors for adults with disabilities online engagement during the COVID-19 pandemic via analysis of data from a self-administered online survey by adults in the US with disabilities (N=409) on food access, school and work, health, and social activities. Online food access was common as 53.5% ordered groceries and 55.3% ordered meals. Of students, 96.0% attended class online. Of respondents who are currently working, 82.5% attended a meeting online. 26.2% of respondents attended an online fitness class and 60% had a telehealth appointment. The most common online social event was attending a virtual party or social gathering (55.3%), followed by streaming a concert or a play (38.9%), and attending a religious event (36.2%). Online engagement during the COVID-19 pandemic varies for people with different types of disabilities. The most notable differences existing in telehealth appointments. People with learning disabilities, anxiety, difficulty speaking, upper extremity limitations were more likely to have completed more telehealth appointments than people with other types of disabilities.

## Keywords

Online engagement, COVID-19 pandemic, disabilities, online engagement during COVID-19

## Introduction

The COVID-19 pandemic led to a rapid increase of online engagement. High levels of online engagement continue across different contexts including ordering food and meals, telehealth, and working remotely in the United States (Dou et al. 212; Wosik et al. 957). The shift to virtual forms of communication and access to resources can reduce barriers for certain groups while creating new barriers for others (Annaswamy et al. 2). Negative effects to the shift for online engagement are not equal across all populations, especially when considering how people with different types of disabilities engage online (Anderson et al. 146; Jesus et al. 7). The rapid shift to online engagement has revealed ongoing barriers for people with different types of disabilities. This study examines how people with different types of disabilities engage in different online activities: food access, school, work, health, and social events.

People with different types of disabilities engage with technology in various manners. Recent studies report that people with different types of disabilities engagement in the community is largely limited due to the need for physical distancing (Annaswamy et al. 1; Gin et al. 7). Social interaction is an important buffer for people with disabilities health and is necessary for maintaining mental and physical health (Tough et al. 15; Warner et al. 1423). A recent study shows that community engagement, such as attending church or social gatherings, are the most limited during the COVID-19 pandemic (Koon et al. 3). For people with disabilities communicating with family and friends continues through virtual platforms like Zoom or Skype, however, little is understood how people with different types of disabilities are engaging with their community during COVID-19 (Anderson et al. 150, Landes et al. 3; Thompson et al. 163). The importance of examining how people with different types of disability are engaging with

their communities, including social events, work, and school, will help to develop strategies for limiting social isolation.

Access to healthcare continues to change during the COVID-19 pandemic for people with different types of disabilities. Healthcare, including communicating with medical staff and therapeutic appointments, is an important factor in reducing adverse health events for people with disabilities (Okoro et al. 882). Telehealth, or telemedicine, has become the primary method to communicate health problems and performing health assessments (Okoro et al. 883). People with different types of disabilities have various needs, and thus, telemedicine is not equally suited for all. For example, dexterity assessment for people with upper extremity limitations or cognitive assessments for people with traumatic brain injuries would be challenging, if not impossible, to do effectively over telehealth. Understanding the access to healthcare across people with different types of disabilities is important for maintaining the diversity of care necessary for all.

Accessing food and groceries has rapidly changed during the COVID-19 pandemic. Online ordering services for meals and/or groceries has become important for people with disabilities accessing food. Studies consistently show that food access is important to maintaining health, especially during the COVID-19 pandemic (Annaswamy et al. 2; Kinsey et al. 334; Niles et al. 5). There is a necessity to explore if patterns exist across people with different types of disabilities' access to food via virtual formats to address previously unknown disparities. The goal of this study is to examine the online activities including food access, school, work, health, and social events that people with different types of disabilities engage in.

## Methods

Data are from the *Technology, the Pandemic, and Social Interaction* survey using a convenience sample of the Consumer Advisory Network (CAN) and Accessibility User Research Collective (AURC). Participants completed the self-administered online questionnaire during April and May of 2021. All current members of the CAN and AURC (1,106) were sent the survey and 36.98% participated in the survey (N=409). The AURC and CAN are both managed by researchers at Rehabilitation Engineering Research Center for Community Living, Health and Function (LiveWell RERC) at Shepherd Center, a rehabilitation hospital in Atlanta, Georgia. CAN and AURC members are U.S.-based national networks of people with disabilities that are 18 years or older and report having a disability or functional limitation.

*Disability* is measured via a series of dichotomous indicators of ‘yes’ and ‘no’. Learning disability, anxiety, and difficulty speaking disability measures were based on responses to the question “*Do you have any difficulty with the following challenges or limitations? (check all that apply)*” and response options of “*Difficulty learning or a learning disability*” for learning disability, “*Frequent worrying, nervousness, or anxiety*” for anxiety, and “*Difficulty speaking so people can understand you*” for difficulty speaking. Dichotomous indicators for blind and deaf were generated based on responses to “*Do you have any of the following vision or hearing limitations? (check all that apply)*” with “*Blind (without usable vision or completely blind)*” and “*Deaf (unable to hear)*”. Walking as well as fatigue and limited stamina measures were generated from responses to “*Do you have any of the following physical challenges or limitations? (check all that apply)*” with “*Difficulty walking or climbing stairs*” for walking and “*Difficulty with fatigue/limited stamina*” for fatigue and limited stamina. Upper extremity limitations is measured by combining responses to “*Do you have any of the following physical*

*challenges or limitations? (check all that apply)*” for *“Difficulty using your arms”* and *“Difficulty using your hands and fingers”*. If respondents selected either or both, they were coded as having an upper extremity limitation.

*Demographic* measures include gender, student status, employment status, race, college graduate, and age. All demographic measures except age are measured as dichotomous indicators. Gender was measured by an indicator *“What is your gender?”* which were recoded from *“Male”*, *“Female”*, and *“Other (please specify)”* to *“Female”* and *“Male”* where *“Other (please specify)”* were dropped due to very small numbers of respondents who responded *“Other (please specify)”*. Student was measured by a dichotomous indicator generated from *“Student (full-time)”* and/or *“Student (part-time)”* to the question *“What is your occupation? (check all that apply)”*. Similarly, employed was measured by a dichotomous indicator via *“Employed (full-time)”* and/or *“Employed (part-time)”* to the question *“What is your occupation? (check all that apply)”*. White is measured by *“What is your race/ethnicity? (check all that apply)”* and respondents who selected *“White or Caucasian”*. College graduate is generated by collapsing *“Associate’s degree”*, *“Bachelor’s degree”*, *“Master’s degree”*, and *“Doctoral degree”* to *“What is the highest level of education you have completed?”*. Age is generated by subtracting responses from *“What year were you born?”* from 2021 to calculate age.

*Online engagement* is measured via dichotomous indicators generated from a check all that apply question *“Have you done any of the following due to COVID-19? (Check all that apply)”*. Each response option aligns with an area of online engagement: food access, school, work, health, and social. For food access, dichotomous indicators were generated for ordered groceries based on the response to *“ordered groceries online or through an app”* and ordered meals based on the response to *“ordered food online or through an app”*. School and work

measures were generated based on the responses to “*attended a class for school online*” for school and “*attended a meeting for work online*” or work. Health measures were generated based on responses to “*had a telehealth appointment*” for telehealth appointment and “*participated in an online fitness class and/or did an online workout video at home*” for online fitness class. Lastly, social measures were generated from “*had a virtual party of social gathering online*” for virtual party or social gathering, “*watched a concert or play that was live streamed*” for streamed a concert or play, and “*attended a religious event online*” for attended a religious event.

Analysis includes descriptive statistics and  $\Phi$  (phi) to test the relationship between pairs of dichotomous indicators (Fleiss et al. 237). Statistical significance is denoted as a p value less than 0.05 (Frankfort-Nachmias and Leon-Guerrero 358). Pairwise deletion was used for case-by-case analysis (Weaver and Maxell 150).

## Analysis

Table 1. Disability and Demographic Summary Statistics (N=409). Data: Technology, the Pandemic, and Social Interaction.

<b>Disability or Demographic</b>	<b>Percent</b>	<b>n</b>
Disability: Learning disability	21.3%	87
Disability: Anxiety	23.5%	96
Disability: Difficulty speaking	9.0%	37
Disability: Upper extremity limitations	18.6%	76
Disability: Walking	24.4%	100
Disability: Fatigue and limited stamina	19.6%	80
Disability: Blind	34.2%	180
Disability: Deaf	3.4%	14
Demographics: Female	53.6%	188
Demographics: Student	6.8%	28
Demographics: Employed	47.4%	194

<b>Disability or Demographic</b>	<b>Percent</b>	<b>n</b>
Demographics: White	75.0%	270
Demographics: College Graduate	69.9%	248

<b>Demographic</b>	<b>Mean</b>	<b>SD</b>
Demographics: Age (range: 20-85)	47.2	14.3

Table 1 includes the descriptive statistics for demographic variables. The most common disability experienced by respondents is blindness (34.2%), followed by walking limitations (24.4%), anxiety (23.5%), learning disability (21.3%), fatigue and limited stamina (19.6%), upper extremity limitations (18.6%), difficulty speaking (9.0%), and deafness (3.4%). Most respondents are female (53.6%), white (75.0%), and college graduates (69.9%) with less than half employed (47.4%) and some students (6.8%).

Table 2. Online Engagement.

Data: Technology, the Pandemic, and Social Interaction.

<b>Online Engagement</b>	<b>%</b>	<b>n</b>
Food Access: Ordered groceries	53.5%	219
Food Access: Ordered meals	55.3%	226
School: Attended a class	96.4%	27
Work: Attended a meeting	82.5%	160
Health: Online fitness class	26.2%	107
Health: Telehealth appointment	60.4%	247
Social: Virtual party or social gathering	55.3%	226
Social: Streamed a concert or a play	38.9%	159
Social: Attended a religious event	36.2%	148

Table 2 contains the descriptive statistics for online engagement. When accessing food online, 53.5% ordered groceries and 55.3% ordered meals. Of students, 96.4% attended class

online. Of those currently working, 82.5% attended a meeting online. 26.2% of respondents attended an online fitness class and 60.4% had a telehealth appointment. The most common online social event was attending a virtual party or social gathering (55.3%), followed by streaming a concert or a play (38.9%), and attending a religious event (36.2%).

Table 3. Analysis of Food Access by Disability Type.

Data: Technology, the Pandemic, and Social Interaction.

Activity	Disability Group	$\Phi$	p-value	Significance
Ordered Groceries	Learning disability	0.530	0.285	
Ordered Groceries	Anxiety	0.530	0.282	
Ordered Groceries	Difficulty speaking	-0.014	0.009	p<0.01
Ordered Groceries	Upper extremity limitations	0.130	0.085	
Ordered Groceries	Walking limitations	0.085	0.085	
Ordered Groceries	Fatigue and limited stamina	0.064	0.197	
Ordered Groceries	Blind	0.217	<0.001	p<0.001
Ordered Groceries	Deaf	-0.040	0.415	
Ordered Meals	Learning disability	0.047	0.340	
Ordered Meals	Anxiety	0.069	0.162	
Ordered Meals	Difficulty speaking	-0.025	0.616	
Ordered Meals	Upper extremity limitations	-0.063	0.201	
Ordered Meals	Walking limitations	0.054	0.272	
Ordered Meals	Fatigue and limited stamina	0.022	0.653	
Ordered Meals	Blind	0.204	<0.001	p<0.001
Ordered Meals	Deaf	0.088	0.074	

More respondents with difficulty speaking had ordered groceries online compared to respondents with other disabilities ( $\Phi=0.014$ , p<0.01). More blind respondents had ordered groceries ( $\Phi=0.217$ , p<.001) and meals ( $\Phi=0.204$ , p<.001) online compared to respondents who are not blind.

Table 4. Analysis of School and Work by Disability Type.

Attended a class: only students in analysis. No deaf respondents were students; Attended a meeting: only employed respondents in analysis; Data: Technology, the Pandemic, and Social

Interaction

Activity	Disability Group	$\Phi$	p-value	Significance
Attended a class	Learning disability	-0.179	0.343	
Attended a class	Anxiety	-0.222	0.240	
Attended a class	Difficulty speaking	-0.413	0.029	p<0.05
Attended a class	Upper extremity limitations	-0.304	0.107	
Attended a class	Walking limitations	-0.304	0.107	
Attended a class	Fatigue and limited stamina	-0.333	0.078	
Attended a class	Blind	0.143	0.448	
Attended a class	Deaf	-	-	
Attended a meeting	Learning disability	-0.002	0.979	
Attended a meeting	Anxiety	0.157	0.029	p<0.05
Attended a meeting	Difficulty speaking	-0.058	0.423	
Attended a meeting	Upper extremity limitations	0.005	0.948	
Attended a meeting	Walking limitations	0.086	0.232	
Attended a meeting	Fatigue and limited stamina	0.125	0.082	
Attended a meeting	Blind	0.011	0.875	
Attended a meeting	Deaf	-0.092	0.201	

Table 4 presents results for disability status and online school and work. Fewer respondents with difficulty speaking who are also students reported attending class online ( $\Phi=-0.413, p<0.05$ ). Respondents who are working and have anxiety were more likely to have attend a meeting online ( $\Phi=0.157, p<0.05$ ).

Table 5. Online Social Activities by Disability Type.

Data: Technology, the Pandemic, and Social Interaction

Activity	Disability Group	$\Phi$	p-value	Significance
Online fitness class	Learning disability	0.139	0.005	p<0.01
Online fitness class	Anxiety	0.143	0.004	p<0.01
Online fitness class	Difficulty speaking	0.103	0.037	p<0.05
Online fitness class	Upper extremity limitations	0.016	0.747	
Online fitness class	Walking limitations	0.024	0.630	
Online fitness class	Fatigue and limited stamina	0.057	0.248	
Online fitness class	Blind	0.016	0.745	
Online fitness class	Deaf	-0.020	0.682	
Telehealth appointment	Learning disability	0.201	<0.001	p<0.001
Telehealth appointment	Anxiety	0.260	<0.001	p<0.001
Telehealth appointment	Difficulty speaking	0.099	0.046	p<0.05
Telehealth appointment	Upper extremity limitations	0.258	<0.001	p<0.001
Telehealth appointment	Walking limitations	0.275	<0.001	p<0.001
Telehealth appointment	Fatigue and limited stamina	-0.027	<0.001	p<0.001
Telehealth appointment	Blind	-0.027	0.587	
Telehealth appointment	Deaf	-0.067	0.172	

Table 5 presents the findings between the relationship of disability type and health activities. Respondents with a learning disability ( $\Phi=0.139$ ,  $p<0.01$ ), anxiety ( $\Phi=0.143$ ,  $p<0.01$ ), or difficulty speaking ( $\Phi=0.103$ ,  $p<0.05$ ) were more likely to have attended an online fitness class. Respondents with a learning disability ( $\Phi=0.201$ ,  $p<0.001$ ), anxiety ( $\Phi=0.260$ ,  $p<0.001$ ), difficulty speaking ( $\Phi=0.099$ ,  $p<0.05$ ), upper extremity limitations ( $\Phi=0.258$ ,  $p<0.001$ ), walking limitations ( $\Phi=0.275$ ,  $p<0.001$ ), and fatigue and limited stamina ( $\Phi=0.299$ ,  $p<0.001$ ) were more likely to have had a telehealth appointment.

Table 6. Analysis of Online Social Activities by Disability Type.

Data: Technology, the Pandemic, and Social Interaction.

Activity	Disability Group	$\Phi$	p-value	Significance
Virtual party or social gathering	Learning disability	0.047	0.340	
Virtual party or social gathering	Anxiety	-0.001	0.991	
Virtual party or social gathering	Difficulty speaking	0.027	0.590	
Virtual party or social gathering	Upper extremity limitations	0.063	0.201	
Virtual party or social gathering	Walking limitations	-0.003	0.953	
Virtual party or social gathering	Fatigue and limited stamina	-0.052	0.292	
Virtual party or social gathering	Blind	0.152	0.002	p<0.01
Virtual party or social gathering	Deaf	0.034	0.489	
Streamed a concert or a play	Learning disability	0.002	0.965	
Streamed a concert or a play	Anxiety	0.008	0.871	
Streamed a concert or a play	Difficulty speaking	-0.024	0.625	
Streamed a concert or a play	Upper extremity limitations	-0.070	0.155	
Streamed a concert or a play	Walking limitations	0.013	0.791	
Streamed a concert or a play	Fatigue and limited stamina	0.011	0.818	
Streamed a concert or a play	Blind	0.165	0.001	p<0.01
Streamed a concert or a play	Deaf	-0.095	0.055	
Attended a religious event	Learning disability	-0.043	0.381	
Attended a religious event	Anxiety	-0.021	0.673	
Attended a religious event	Difficulty speaking	-0.007	0.889	
Attended a religious event	Upper extremity limitations	0.137	0.005	p<0.01
Attended a religious event	Walking limitations	0.081	0.103	
Attended a religious event	Fatigue and limited stamina	0.065	0.190	
Attended a religious event	Blind	0.079	0.111	
Attended a religious event	Deaf	-0.002	0.970	

Table 5 contains the results on the relationship between disability types and online social activities. Blind respondents were more likely to have attended a virtual party or social gathering ( $\Phi=0.152$ ,  $p<0.01$ ) and streamed a concert or a play ( $\Phi=0.165$ ,  $p<0.01$ ). Respondents with upper

extremity limitations were more likely to have attended online religious events ( $\Phi=0.137$ ,  $p<0.01$ ).

## Conclusions

People with disabilities have a high level of online engagement. For food access, over half have ordered groceries online (53.5%) and ordered meals online (55.3%). For those who are students, nearly all (96.4%) have attended a class online due to COVID-19. Similarly, most who work have attended a meeting online related to their employment (82.5%). In relation to health, about a quarter of adults with disabilities completed an online fitness class (26.2%) and over half have had a telehealth appointment (60.4%). Social events are also commonly occurring online including virtual parties and social gatherings (55.3%), streaming live concerts and/or plays (38.9%) and attending religious events (36.2%).

These trends are not homogenous across disability groups. Online engagement during the COVID-19 pandemic varies for people with different types of disabilities. All overarching categories have significant results with the most notable differences existing in telehealth appointments. People with learning disabilities, anxiety, difficulty speaking, or upper extremity limitations have completed more telehealth appointments than people with fatigue and limited stamina.

To that end, people with disabilities are not uniform in how they engage in online activities and future research must consider the various challenges that people with disability encounter with online engagement. It is crucial to understand the patterns of online engagement among people with disabilities to develop strategies for access to communication resources. These finding should be deeply considered when developing online platforms for food access, school, work, social events, as well as healthcare.

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