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Letters

RESEARCH LETTER

Disparities in the Uptake of Telemedicine During the COVID-19 Surge in a Multidisciplinary Head and Neck Cancer Population by Patient Demographic Characteristics and Socioeconomic Status

During the coronavirus disease 2019 (COVID-19) pandemic, outpatient clinics were shut down to stem virus spread. Before COVID-19, Henry Ford Health System (Detroit, Michigan) used telemedicine within limited subsets of patients. After Henry Ford Health System clinics closed on March 17, 2020, the need to continue care necessitated a rapid adaptation of telemedicine. This presented an opportunity for widespread telemedicine use within the multidisciplinary head and neck oncology team. The purpose of this article is to describe the associations between patient demographic characteristics



Supplemental content

and socioeconomic disparities and the engagement in telemedicine during the pandemic.

Methods | Following institutional review board approval from Henry Ford Health System, patients 18 years and older with a head and neck cancer-related diagnosis evaluated between March 17 to April 24, 2020, were included in this retrospective cohort. Informed consent was waived because of the retrospective nature of the study. For comparison, a cohort from March 17 to April 24, 2019, was used. Encounters associated with daily radiation treatment were excluded. Patient age, sex, race, and insurance status were collected. The following socioeconomic status 2010 census block-level data were obtained as proxy for patient socioeconomic status and divided into quartiles: median household income, completion of high school education or higher, married marital status, employment status, English-speaking households, and households with incomes above the federal poverty level.

Table 1. Baseline Characteristics of Patients Seen From March 17 to April 24, 2020, and March 17 to April 24, 2019, According to Type of Visit

Characteristic	Frequency, No. (%)				2019	
	2020 Virtual video visit (n = 121)	Telephone visit (n = 60)	In-person visits (n = 35)	Canceled (n = 18)	In-person visits (n = 372)	Canceled (n = 22)
Age	63 (20-90)	62 (32-93)	63 (34-81)	63 (32-75)	63 (17-88)	57 (21-93)
Sex						
Male	77 (63.6)	39 (65.0)	23 (65.7)	7 (38.9)	214 (57.5)	13 (59.1)
Female	44 (36.4)	21 (35.0)	12 (34.3)	11 (61.1)	158 (42.8)	9 (40.9)
Race						
White	79 (65.3)	34 (56.7)	23 (65.7)	11 (61.1)	234 (62.9)	6 (27.3)
Black	25 (20.7)	17 (28.3)	7 (20.0)	4 (22.2)	89 (23.9)	14 (63.6)
Other	17 (14.1)	9 (15.0)	5 (14.3)	3 (16.7)	49 (13.2)	2 (9.1)
Insurance type						
HMO	39 (32.3)	14 (23.3)	10 (28.6)	2 (11.1)	83 (22.3)	3 (13.6)
PPO	30 (24.8)	5 (8.3)	4 (11.4)	1 (5.6)	72 (19.4)	1 (4.6)
Medicare	40 (22.1)	24 (40.0)	12 (34.3)	9 (20.0)	148 (39.8)	7 (31.8)
Medicaid/none/other public	11 (9.1)	15 (25.0)	7 (20.0)	6 (33.3)	57 (15.3)	10 (45.4)
Unknown	1 (0.8)	2 (3.3)	2 (5.7)	0 (0)	12 (3.2)	1 (4.6)
Education level ^a						
Lowest	25 (20.7)	17 (28.3)	6 (17.1)	4 (22.2)	92 (24.7)	10 (45.4)
Third	33 (27.3)	12 (20.0)	15 (42.9)	5 (27.8)	81 (21.8)	8 (36.4)
Second	28 (23.1)	13 (21.7)	8 (22.9)	7 (38.9)	95 (25.5)	3 (13.6)
Highest	32 (26.4)	17 (28.3)	5 (14.3)	2 (11.1)	97 (26.1)	1 (4.6)
Missing	3 (2.5)	1 (1.7)	1 (2.9)	0 (0)	7 (1.9)	0 (0)
Median household income						
Lowest	24 (19.8)	20 (33.3)	9 (25.7)	2 (11.1)	86 (23.1)	13 (59.1)
Third	27 (22.3)	9 (15.0)	7 (20.0)	8 (44.4)	96 (25.8)	7 (31.8)
Second	30 (24.8)	18 (30.0)	13 (37.1)	6 (33.3)	85 (22.8)	2 (9.1)
Highest	37 (30.6)	11 (18.3)	5 (14.3)	2 (11.1)	98 (26.3)	0 (0)
Missing	3 (2.5)	2 (3.3)	1 (2.9)	0 (0)	7 (1.9)	0 (0)

(continued)

Table 1. Baseline Characteristics of Patients Seen From March 17 to April 24, 2020, and March 17 to April 24, 2019, According to Type of Visit (continued)

Characteristic	Frequency, No. (%)					
	2020				2019	
	Virtual video visit (n = 121)	Telephone visit (n = 60)	In-person visits (n = 35)	Canceled (n = 18)	In-person visits (n = 372)	Canceled (n = 22)
Married marital status^b						
Lowest	28 (23.1)	16 (26.7)	7 (20.0)	2 (11.1)	88 (23.7)	13 (59.1)
Third	26 (21.5)	13 (21.7)	13 (37.1)	7 (38.9)	90 (24.2)	5 (22.7)
Second	31 (27.3)	13 (21.7)	10 (28.6)	6 (33.3)	92 (24.7)	3 (13.6)
Highest	33 (27.3)	17 (28.3)	4 (11.4)	3 (16.7)	95 (25.5)	1 (4.6)
Missing	3 (2.5)	1 (1.7)	1 (2.9)	0 (0)	7 (1.9)	0 (0)
English speaking^c						
Lowest	29 (24.0)	15 (25.0)	13 (37.1)	3 (16.7)	91 (24.5)	3 (13.6)
Third	27 (22.3)	8 (13.3)	6 (17.1)	4 (22.2)	105 (28.2)	4 (18.2)
Second	26 (21.5)	19 (31.6)	9 (25.7)	5 (27.8)	89 (23.9)	7 (31.8)
Highest	36 (29.8)	17 (28.3)	6 (17.1)	6 (33.3)	80 (21.5)	8 (36.4)
Missing	3 (2.5)	1 (1.7)	1 (2.9)	0 (0)	7 (1.9)	0 (0)
Employment rate^d						
Lowest	26 (21.5)	9 (15.0)	12 (34.3)	5 (27.8)	92 (24.7)	10 (45.4)
Third	28 (23.1)	18 (30.0)	7 (20.0)	4 (22.2)	90 (24.2)	7 (31.8)
Second	33 (25.6)	21 (35.0)	9 (25.7)	5 (27.8)	84 (22.6)	2 (9.1)
Highest	31 (25.6)	11 (18.3)	6 (17.1)	4 (22.2)	99 (26.6)	3 (13.6)
Missing	3 (2.5)	1 (1.7)	1 (2.9)	0 (0)	7 (1.9)	0 (0)
Household income above the poverty line^e						
Lowest	24 (19.8)	17 (28.3)	7 (20.0)	1 (5.6)	90 (24.2)	15 (68.2)
Third	30 (24.8)	12 (20.0)	14 (40.0)	9 (50.0)	86 (23.1)	4 (18.2)
Second	33 (27.3)	17 (28.3)	8 (22.9)	5 (27.8)	87 (23.4)	3 (13.6)
Highest	31 (25.6)	12 (20.0)	5 (14.3)	3 (16.7)	102 (27.4)	0 (0)
Missing	3 (2.5)	2 (3.33)	1 (2.9)	0 (0)	7 (1.9)	0 (0)

Abbreviations: HMO, health maintenance organization; PPO, preferred provider organization.

^a Proportion of individuals 25 years or older completing high school or a obtaining General Educational Development or higher education.

^b Proportion of individuals 18 years or older declaring a married marital status.

^c Proportion of individuals 5 years and older with the ability to speak English.

^d Proportion of individuals 16 years old or older currently employed.

^e Proportion of households with incomes above the federal poverty line.

Encounter and patient-level data were collected. Visit types included (1) virtual visits (completed using live audio and video), (2) telephone visits (completed only using telephone), (3) in-person visits, and (4) no-show visits. Descriptive statistics, univariate, and stepwise multivariable logistic regression were used to identify independent predictors of completion of the visit by type of visit. Statistical analyses were conducted using Stata, version 14 (StataCorp), and statistical significance was set at $P < .05$. Univariate analyses are detailed in the eTable in the Supplement.

Results | A total of 401 encounters occurred from March 17 to April 24, 2020, and 346 encounters (86.3%) were completed by 234 patients (Table 1). Eighty-seven (25.1%) were in-person, 170 (49.1%) were virtual, and 89 (23.6%) were telephone visits. Comparatively, 551 of 582 visits (94.7%) were completed during 2019 by 394 patients ($P < .001$; Table 1). No telemedicine visits were completed during 2019.

For virtual visits, after multivariable adjustment for insurance type, household income, and education level, those with

Medicaid/none/other public insurances (odds ratio [OR], 0.26; 95% CI, 0.10-0.66) and low median household income (second quartile OR, 0.33; 95% CI, 0.14-0.82; lowest quartile OR, 0.22; 95% CI, 0.07-0.74) had lower completion of virtual visits (Table 2). No factors were associated with telephone visit completion. After adjusting for sex, insurance status, and households with incomes above the poverty line, female sex (OR, 0.27; 95% CI, 0.09-0.79) and patients with Medicaid/none/other public insurances (OR, 0.09; 95% CI, 0.01-0.51) were less likely to complete any type of visit during the COVID-19 pandemic (Table 2). Multivariable analysis comparing patients completing any visit in 2020 vs 2019 found no significant predictors (Table 2).

Discussion | This study demonstrates that telemedicine can be used for a diverse population to provide multidisciplinary oncologic care when in-person care cannot be safely delivered. No demographic, insurance, or socioeconomic differences were observed between patients seen during the COVID-19 pandemic and those in the previous year. Uninsured patients, patients with Medicaid, and patients with lower median household in-

Table 2. Multivariable Logistic Regression for Completion of a Virtual Visit in 2020, Any Visit in 2020, and Any Visit in 2020 Compared With 2019

Characteristic	OR (95% CI)		
	Any virtual visit ^a	Any visit (virtual, telephone, in person), 2020 ^b	Completed visits in 2020 vs 2019 ^c
Sex			
Male	NA	1 [Reference]	NA
Female		0.27 (0.09-0.79)	0.73 (0.61-1.25)
Insurance type			
HMO	1 [Reference]	NA	NA
PPO	2.01 (0.81-4.99)	0.93 (0.08-11.10)	0.71 (0.42-1.18)
Medicare	0.55 (0.27-1.10)	0.23 (0.05-1.12)	0.66 (0.43-1.02)
Medicaid/none/other public	0.26 (0.10-0.66)	0.09 (0.01-0.51)	0.75 (0.44-1.29)
Median household income			
Highest	1 [Reference]	NA	NA
Second	0.34 (0.14-0.82)		
Third	0.47 (0.17-1.32)		
Lowest	0.22 (0.07-0.74)		
English speaking^d			
Highest	1 [Reference]	NA	NA
Second	1.23 (0.50-3.02)		
Third	1.83 (0.69-4.84)		
Lowest	3.09 (0.90-10.63)		
Household income above poverty line^e			
Highest	NA	1 [Reference]	NA
Second		0.77 (0.72-100.93)	
Third		0.55 (0.12-2.43)	
Lowest		8.52 (0.16-3.67)	

Abbreviation: NA, not applicable.

^a Adjusted for insurance type, median household income, and proportion of English-speaking individuals within a census block.

^b Adjusted for sex, insurance type, and proportion of households with incomes above the poverty line.

^c Adjusted for sex and insurance type.

^d Proportion of individuals 5 years and older with the ability to speak English.

^e Proportion of households with incomes above the federal poverty line.

comes had less odds of completing a virtual care visit. However, this disparity was not demonstrated in telephone visits. While synchronous audio and visual communication in virtual visits offer a more comprehensive assessment, telephone visits may be an important avenue to access care, supporting the expansion of covered visit types by the Centers of Medicare & Medicaid Services.¹ This study is limited by its use of census-level rather than patient-level data. As well, appointments that were cancelled before the visit were unable to be counted. Thus, the population of patients unable to be seen during the initial surge may be underestimated. The reasons for inability to complete visits was unknown, which needs to be explored in a future study. As virtual care becomes more integrated into oncology practices during and after the coronavirus disease 2019 pandemic, attention must be paid to addressing issues with access to care, especially in already disadvantaged patient populations.

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Author Contributions: Dr Tam had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Tam, Wu, Williams, Sheqwarra, Siddiqui, Chang.

Acquisition, analysis, or interpretation of data: Tam, Williams, Girgis, Sheqwarra, Chang.

Drafting of the manuscript: Tam, Williams, Sheqwarra, Chang.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Tam, Sheqwarra, Chang.

Administrative, technical, or material support: Williams, Girgis, Chang.

Supervision: Williams, Siddiqui, Chang.

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