Bridging the Digital Divide in Teledermatology Usage: A Retrospective Review of Patient Visits

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PRACTICE **POINTS**

- There is increased use of synchronous video visits (SVs) among Black patients, patients with Medicaid, and patients who are underinsured.
- Synchronous video visits may increase dermatologic care utilization for medically marginalized groups.
- Efforts are needed to increase engagement with dermatologic care for Hispanic and male patients.

We sought to analyze the demographics of patients utilizing synchronous video visits (SVs), asynchronous visits (AVs), and in-office visits (IVs) following the implementation of SVs. We conducted a retrospective review of medical records and gathered patient demographics from 17,130 initial dermatology visits between July and December 2020. Diagnosis, age, sex, race, ethnicity, and insurance type were compared across visit types. We concluded that the implementation of SVs may increase access to dermatologic care among medically marginalized patients. Patient engagement and education as well as advocacy for continued Medicaid payment parity regulations for SVs are needed to increase dermatologic care access.

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Teledermatology is an effective patient care model for the delivery of high-quality dermatologic care.[1] Teledermatology can occur using synchronous, asynchronous, and hybrid models of care. In asynchronous visits (AVs), patients or health professionals submit photographs and information for dermatologists to review and provide treatment recommendations. With synchronous visits (SVs), patients have a visit with a dermatology health professional in real time via live video conferencing software. Hybrid models incorporate asynchronous strategies for patient intake forms and skin photograph submissions as well as synchronous methods for live video consultation in a single visit.[1] However, remarkable inequities in internet access limit telemedicine usage among medically marginalized patient populations, including racialized, elderly, and low socioeconomic status groups.[2]

Synchronous visits, a relatively newer teledermatology format, allow for communication with dermatology professionals from the convenience of a patient's selected location. The live interaction of SVs allows dermatology professionals to answer questions, provide treatment recommendations, and build therapeutic relationships with patients. Concerns for dermatologist reimbursement, malpractice/liability, and technological challenges stalled large-scale uptake of teledermatology platforms.[3] The COVID-19 pandemic led to a drastic increase in teledermatology usage of approximately 587.2%, largely due to public safety measures and Medicaid reimbursement parity between SV and in-office visits (IVs).[3,4]

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The eTable is available in the Appendix online at www.mdedge.com/dermatology.

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With the implementation of SVs as a patient care model, we investigated the demographics of patients who utilized SVs, AVs, or IVs, and we propose strategies to promote equity in dermatologic care access.

Methods

This study was approved by the University of Pittsburgh institutional review board (STUDY20110043). We performed a retrospective electronic medical record review of deidentified data from the University of Pittsburgh Medical Center, a tertiary care center in Allegheny County, Pennsylvania, with an established asynchronous teledermatology program. Hybrid SVs were integrated into the University of Pittsburgh Medical Center patient care visit options in March 2020. Patients were instructed to upload photographs of their skin conditions prior to SV appointments. The study included visits occurring between July and December 2020. Visit types included SVs, AVs, and IVs.

We analyzed the initial dermatology visits of 17,130 patients aged 17.5 years and older. Recorded data included diagnosis, age, sex, race, ethnicity, and insurance type for each visit type. Patients without a reported race (990 patients) or ethnicity (1712 patients) were excluded from analysis of race/ethnicity data. Patient zip codes were compared with the zip codes of Allegheny County municipalities as reported by the Allegheny County Elections Division.

Statistical Analysis—Descriptive statistics were calculated; frequency with percentage was used to report categorical variables, and the mean (SD) was used for normally distributed continuous variables. Univariate analysis was performed using the χ^2 test for categorical variables. One-way analysis of variance was used to compare age among visit types. Statistical significance was defined as $P<.05$. IBM SPSS Statistics for Windows, Version 24 (IBM Corp) was used for all statistical analyses.

Results

In our study population, 81.2% (13,916) of patients were residents of Allegheny County, where 51.6% of residents are female and 81.4% are older than 18 years according to data from 2020.[5] The racial and ethnic demographics of Allegheny County were 13.4% African American/Black, 0.2% American Indian/Alaska Native, 4.2% Asian, 2.3% Hispanic/Latino, and 79.6% White. The percentage of residents who identified as Native Hawaiian/Pacific Islander was reported to be greater than 0% but less than 0.5%.[5]

In our analysis, IVs were the most utilized visit type, accounting for 71.5% (12,240) of visits, followed by 15.0% (2577) for SVs and 13.5% (2313) for AVs. The mean age (SD) of IV patients was 51.0 (18.8) years compared with 39.9 (16.9) years for SV patients and 37.5 (14.3) years for AV patients (eTable). The majority of patients for all visits were female: 62.1% (7599) for IVs, 71.4% (1652) for AVs, and 72.8% (1877) for SVs. The largest racial or ethnic group for all visit types included White patients (83.8% [13,524] of all patients), followed by Black (12.4% [2007]), Hispanic/Latino (1.4% [209]), Asian (3.4% [555]), American Indian/Alaska Native (0.2% [35]), and Native Hawaiian/Other Pacific Islander patients (0.1% [19]).

Asian patients, who comprised 4.2% of Allegheny County residents,[5] accounted for 2.7% (334) of IVs, 4.9% (113) of AVs, and 4.2% (108) of SVs. Black patients, who were reported as 13.4% of the Allegheny County population,[5] were more likely to utilize SVs (19% [490]) compared with AVs (7.5% [174]) and IVs (11% [1343]). Hispanic/Latino patients had a disproportionally lower utilization of dermatologic care in all settings, comprising 1.4% (209) of all patients in our study compared with 2.3% of Allegheny County residents.[5] White patients, who comprised 79.6% of Allegheny County residents, accounted for 81.1% (9928) of IVs, 67.4% (1737) of SVs, and 80.4% (1859) of AVs. There was no significant difference in the percentage of American Indian/Alaska Native and Native Hawaiian/Other Pacific Islander patients among visit types.

The 3 most common diagnoses for IVs were skin cancer screening, seborrheic keratosis, and melanocytic nevus (Table 1). Skin cancer screening was the most common diagnosis, accounting for 12.2% (8530) of 69,812 IVs. The 3 most common diagnoses for SVs were acne vulgaris, dermatitis, and psoriasis. The 3 most common diagnoses for AVs were acne vulgaris, dermatitis, and perioral dermatitis.

Private insurance was the most common insurance type among all patients (71.4% [12,224])(Table 2). A higher percentage of patients with Medicaid insurance (17.9% [461]) utilized SVs compared with AVs (10.1% [233]) and IVs (11.3% 1385]). Similarly, a higher percentage of patients with no insurance or no insurance listed

TABLE 1. Top 3 Diagnoses by Visit Type

Diagnosis via IV, n (%)(n=69,812)	Diagnosis via SV, n (%) (n=4164)	Diagnosis via AV, n (%)(n=2386)
Encounter for screening for malignant neoplasm of skin, 8530 (12.2)	Acne vulgaris, 905 (21.7)	Acne vulgaris, 454 (19)
Other seborrheic keratosis, 6621 (9.5)	Dermatitis unspecified, 378 (9.1)	Dermatitis unspecified, 372 (15.6)
Melanocytic nevus unspecified, 6183 (8.9)	Psoriasis unspecified, 165 (4.0)	Perioral dermatitis, 68 (2.8)

Abbreviations: AV, asynchronous visit; IV, in-office visit; SV, synchronous video visit.

TABLE 2. Patient Insurance Type by Visit Type (N=17,130)

	Visit type			
Insurance	IV	SV	AV	Total
Medicare, n (%)	1886 (15.4)	155 (6.0)	60 (2.6)	2101 (12.3)
Medicaid, n (%)	1385 (11.3)	461 (17.9)	233 (10.1)	2079 (12.1)
Private, n (%)	8710 (71.2)	1625 (63.1)	1889 (81.7)	12,224 (71.4)
Public, n (%)	56 (0.5)	14 (0.5)	14 (0.6)	84 (0.5)
Underinsured/ missing, n (%)	203 (1.7)	322 (12.5)	117 (5.1)	642 (3.7)

Abbreviations: AV, asynchronous visit; IV, in-office visit; SV, synchronous video visit.

were seen via SVs (12.5% [322]) compared with AVs (5.1% [117]) and IVs (1.7% [203]). Patients with Medicare insurance used IVs (15.4% [1886]) more than SVs (6.0% [155]) or AVs (2.6% [60]). There was no significant difference among visit type usage for patients with public insurance.

Comment

Teledermatology Benefits—In this retrospective review of medical records of patients who obtained dermatologic care after the implementation of SVs at our institution, we found a proportionally higher use of SVs among Black patients, patients with Medicaid, and patients who are underinsured. Benefits of teledermatology include decreases in patient transportation and associated costs, time away from work or home, and need for childcare.[6] The SV format provides the additional advantage of direct live interaction and the development of a patient-physician or patient–physician assistant relationship. Although the prerequisite technology, internet, and broadband connectivity preclude use of teledermatology for many vulnerable patients,[2] its convenience ultimately may reduce inequities in access.

Disparities in Dermatologic Care—Hispanic ethnicity and male sex are among described patient demographics associated with decreased rates of outpatient dermatologic care.[7] We reported disparities in dermatologic care utilization across all visit types among Hispanic patients and males. Patients identifying as Hispanic/Latino composed only 1.4% (n=209) of our study population compared with 2.3% of Allegheny County residents.[5] During our study period, most patients seen were female, accounting for 62.1% to 72.8% of visits, compared with 51.6% of Allegheny County residents.[5] These disparities in dermatologic care use may have implications for increased skin-associated morbidity and provide impetus for dermatologists to increase engagement with these patient groups.

Characteristics of Patients Using Teledermatology—Patients using SVs and AVs were significantly younger (mean age [SD], 39.9 [16.9] years and 37.5 [14.3] years, respectively) compared with those using IVs (51.0 [18.8] years). This finding reflects known digital knowledge barriers among older patients.[8,9] The synchronous communication format of SVs simulates the traditional visit style of IVs, which may be preferable for some patients. Continued patient education and advocacy for broadband access may increase teledermatology use among older patients and patients with limited technology resources.[8]

Teledermatology visits were used most frequently for acne and dermatitis, while IVs were used for skin cancer screenings and examination of concerning lesions. This usage pattern is consistent with a previously described consensus among dermatologists on the conditions most amenable to teledermatology evaluation.[3]

Medicaid reimbursement parity for SVs is in effect nationally until the end of the COVID-19 public health emergency declaration in the United States.[10] As of February 2023, the public health emergency declaration has been renewed 12 times since January 2020, with the most recent renewal on January 11, 2023.[11] As of January 2023, 21 states have enacted legislation providing permanent reimbursement parity for SV services. Six additional states have some payment parity in place, each with its own qualifying criteria, and 23 states have no payment parity.[12] Only 25 Medicaid programs currently provide reimbursement for AV services.[13]

Study Limitations—Our study was limited by lack of data on patients who are multiracial and those who identify as nonbinary and transgender. Because of the low numbers of Hispanic patients associated with each race category and a high number of patients who did not report an ethnicity or race, race and ethnicity data were analyzed separately. For SVs, patients were instructed to upload photographs prior to their visit; however, the percentage of patients who uploaded photographs was not analyzed.

Conclusion

Expansion of teledermatology services, including SVs and AVs, patient outreach and education, advocacy for broadband access, and Medicaid payment parity, may improve dermatologic care access for medically marginalized groups. Teledermatology has the potential to serve as an effective health care option for patients who are racially minoritized, older, and underinsured. To further assess the effectiveness of teledermatology, we plan to analyze the number of SVs and AVs that were referred to IVs. Future studies also will investigate the impact of implementing patient education and patient-reported outcomes of teledermatology visits.

REFERENCES

1. Lee JJ, English JC. Teledermatology: a review and update. *Am J Clin Dermatol*. 2018;19:253-260.
2. Bakhtiar M, Elbuluk N, Lipoff JB. The digital divide: how COVID-19's telemedicine expansion could exacerbate disparities. *J Am Acad Dermatol*. 2020;83:E345-E346.
3. Kennedy J, Arey S, Hopkins Z, et al. dermatologist perceptions of teledermatology implementation and future use after COVID-19: demographics, barriers, and insights. *JAMA Dermatol.* 2021;157:595-597.
4. Centers for Disease Control and Prevention. Using telehealth to expand access to essential health services during the COVID-19 pandemic. Updated June 10, 2020. Accessed February 10, 2023. https://www.cdc.gov/coronavirus/2019-ncov/hcp/telehealth.html
5. United States Census Bureau. QuickFacts: Allegheny County, Pennsylvania. Accessed August 12, 2021. https://www.census.gov/quickfacts/alleghenycountypennsylvania
6. Moore HW. Teledermatology—access to specialized care via a different model. *Dermatology Advisor.* November 12, 2019. Accessed February 10, 2023. https://www.dermatologyadvisor.com/home/topics/practice-management/teledermatology-access-to-specialized-care-via-a-different-model/
7. Tripathi R, Knusel KD, Ezaldein HH, et al. Association of demographic and socioeconomic characteristics with differences in use of outpatient dermatology services in the United States. *JAMA Dermatol*. 2018;154:1286-1291.
8. Nouri S, Khoong EC, Lyles CR, et al. Addressing equity in telemedicine for chronic disease management during the COVID-19 pandemic [published online May 4, 2020]. *NEJM Catal Innov Care Deliv*. doi:10.1056/CAT.20.0123
9. Swenson K, Ghertner R. People in low-income households have less access to internet services—2019 update. Office of the Assistant Secretary for Planning and Evaluation; US Department of Health and Human Services. March 2021. Accessed February 10, 2023. https://aspe.hhs.gov/sites/default/files/private/pdf/263601/internet-access-among-low-income-2019.pdf
10. Centers for Medicare and Medicaid Services. COVID-19 frequently asked questions (FAQs) on Medicare fee-for-service (FFS) billing. Updated August 16, 2022. Accessed February 10, 2023. https://www.cms.gov/files/document/03092020-covid-19-faqs-508.pdf
11. US Department of Health and Human Services. Renewal of determination that a public health emergency exists. Updated February 9, 2023. Accessed February 20, 2023. https://aspr.hhs.gov/legal/PHE/Pages/COVID19-9Feb2023.aspx?
12. Augenstein J, Smith JM. Executive summary: tracking telehealth changes state-by-state in response to COVID-19. Updated January 27, 2023. Accessed February 10, 2023. https://www.manatt.com/insights/newsletters/covid-19-update/executive-summary-tracking-telehealth-changes-stat
13. Center for Connected Health Policy. Policy trend maps: store and forward Medicaid reimbursement. Accessed June 23, 2022. https://www.cchpca.org/policy-trends/

APPENDIX

eTABLE. Patient Demographics by Visit Type (N=17,130)

	Visit type		
Patient demographic	**IV**	**SV**	**AV**
Total patients, n (%)	12,240 (71.5)	2577 (15.0)	2313 (13.5)
Mean age (SD), y	51.0 (18.8)	39.9 (16.9)	37.5 (14.3)
Female, n (%)	7599 (62.1)	1877 (72.8)	1652 (71.4)
Race, n (%)[a]			
American Indian/Alaska Native	21 (0.2)	10 (0.4)	4 (0.2)
Asian	334 (2.7)	108 (4.2)	113 (4.9)
African American/Black	1343 (11)	490 (19)	174 (7.5)
Hispanic/Latino	130 (1.1)	34 (1.3)	45 (1.9)
Native Hawaiian/Other Pacific Islander	12 (0.01)	5 (0.19)	2 (0.09)
White	9928 (81.1)	1737 (67.4)	1859 (80.4)

Abbreviations: AV, asynchronous visit; IV, in-office visit; SV, synchronous video visit.

[a]The values listed indicate the total number of patients seen in each visit setting (n=1640). The numbers in the parentheses indicate the percentage of patients seen in each visit setting.