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Assessment of teledermatology education during residency training: a nationwide survey of residents and program directors

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To the Editor:

Teledermatology, defined as use of telecommunication technologies to virtually diagnose and treat dermatologic conditions, can increase access to specialists, alleviate healthcare disparities, and reduce delays in care [1-4]. Teledermatology is a timely solution for healthcare provision during the coronavirus disease 2019 (COVID-19) pandemic as many physicians have augmented their virtual clinical capabilities to deliver safe care. However, little is known about teledermatology training in dermatology residencies, resident comfort with teledermatology, or attitudes toward teledermatology. In 2016, Qureshi and Mostaghimi reported that only 21% of residents had participated in teledermatology [5]. Given the rapidly changing context of teledermatology utilization, herein we explore the landscape of teledermatology education prior to the COVID-19 crisis, factors that increase resident comfort with teledermatology, and the attitudes of dermatology residents and program directors (PD) toward teledermatology.

We administered surveys regarding teledermatology education to dermatology residents and PD nationwide using the Association of Professors of Dermatology listserv in the fall of 2018. Descriptive statistics were performed and univariate and

multivariable analyses were done to identify factors associated with resident comfort with teledermatology. Chi-squared tests were utilized to determine significance ($P \leq 0.05$). Multivariable models were built by stepwise regression using the likelihood ratio test. Statistical analyses were performed using STATA v14.0 (College Station, TX). This study received approval from the University of Texas at Austin Institutional Review Board and all participants provided informed consent prior to participating in the survey.

Approximately 15% (N=215) of dermatology residents and 26% (N=37) of PD in the United States responded to the survey (**Table 1**). Fifty-nine percent of residents (N=127) reported participating in teledermatology cases during residency, 22% (N=47) in over fifty cases. Sixty-one percent (N=130) reported receiving teledermatology didactic sessions. Most (N=149; 69%) believed teledermatology education should be required in residency. Seventy-eight percent of PD (N=29) indicated that their residents participated in teledermatology with half (N=18; 49%) reporting average resident participation of more than fifty cases. Of PD, 78% (N=29) reported teledermatology didactics at their institutions. Physician-to-physician store-and-forward teledermatology was the most common type reported by PD and residents.

Of the residents who participated in teledermatology, 73% (N=93) reported that they felt comfortable with teledermatology. Fifty-nine

Table 1. Resident and program director demographics.

| | Total Resident Respondents | Number (%) | Total Program Director Respondents | Number (%) |
|---|----------------------------|------------|------------------------------------|------------------|
| Gender | 215 | | 37 | |
| Male | | 70 (32.6) | | 14 (37.8) |
| Female | | 145 (67.4) | | 23 (62.2) |
| Median Age (Interquartile Range) | 203 | 30 (28-32) | 32 | 42.0 (37.0-49.5) |
| Post-Graduate Year | 215 | | - | |
| 2 | | 79 (36.7) | | - |
| 3 | | 69 (32.1) | | - |
| 4 | | 67 (31.2) | | - |
| Program Size Per Year (Number of Residents) | 215 | | 36 | |
| 1-3 | | 67 (31.2) | | 12 (32.4) |
| 4-6 | | 90 (41.9) | | 12 (32.4) |
| 7+ | | 58 (26.9) | | 12 (32.4) |
| Program Location | 215 | | 37 | |
| Northeast | | 59 (27.4) | | 7 (18.9) |
| Southeast | | 41 (19.1) | | 5 (13.5) |
| Southwest | | 30 (14.0) | | 5 (13.5) |
| West | | 31 (14.4) | | 11 (29.7) |
| Midwest | | 54 (25.1) | | 9 (24.3) |
| Number of Teledermatology Cases Performed | 215 | | 37 | |
| None | | 88 (40.9) | | 8 (21.6) |
| 1-5 | | 21 (9.8) | | 1 (2.7) |
| 6-10 | | 16 (7.4) | | 2 (5.4) |
| 11-30 | | 28 (13.0) | | 6 (16.2) |
| 31-50 | | 15 (7.0) | | 2 (5.4) |
| >50 | | 47 (21.9) | | 18 (48.6) |
| Presence of Teledermatology Rotation | 214 | | 37 | |
| No | | 160 (74.8) | | 27 (73.0) |
| Yes | | 54 (25.2) | | 10 (27.0) |
| Type of Didactic Received | 213 | | 37 | |
| None | | 83 (40.0) | | 8 (21.6) |
| Formal Lecture | | 34 (16.0) | | 7 (18.9) |
| Demonstration | | 33 (15.5) | | 16 (43.2) |
| Informal Instruction | | 111 (52.1) | | 25 (67.6) |
| Type of Teledermatology | 215 | | 37 | |
| Live Video | | 57 (26.5) | | 12 (32.4) |
| Store-and-forward (physician-to-patient) | | 34 (15.8) | | 26 (70.2) |
| Store-and-forward (physician-to-physician) | | 90 (41.9) | | 11 (29.7) |
| Location | 126 | | 29 | |
| Inpatient | | 35 (27.8) | | 12 (41.4) |
| VA Outpatient | | 73 (57.9) | | 14 (48.3) |
| Safety Net/Continuity Clinic | | 23 (18.3) | | 9 (31.0) |
| Attending Outpatient Practice | | 42 (33.3) | | 11 (37.9) |
| Other | | 14 (11.1) | | 3 (10.3) |

percent (N=126) of all residents believed teledermatology would be important in their future practices. Our data indicate a direct relationship between number of teledermatology cases performed and teledermatology comfort (**Table 2**).

In multivariable modeling, the number of cases remained most strongly correlated with teledermatology comfort (odds ratio [OR] 36 for ≥ 50 cases, 95% confidence interval [CI] 6.96-189.93, $P < 0.001$). Presence of teledermatology didactics (OR

Table 2. Teledermatology resident comfort and multivariable models.

| Variable | Total number responding (N) | Number of Residents (%) | Number Reporting Comfort (%) | Univariate Analysis | | Full Multivariable Model | | Best Adjusted Multivariable Model | |
|--------------------------------------|-----------------------------|-------------------------|------------------------------|---------------------|---------|--------------------------|---------|-----------------------------------|---------|
| | | | | Odds Ratio (95% CI) | P Value | Odds Ratio (95% CI) | P Value | Odds Ratio (95% CI) | P Value |
| Number of Cases | 127 | | | | | | | | |
| 1-10 | | 37 (29.1) | 14 (37.8) | - | - | - | - | - | - |
| 11-30 | | 28 (22.1) | 21 (75.0) | 4.9 (1.7-14.6) | 0.004 | 5.90 (1.79-19.50) | 0.004 | 6.59 (1.99-21.84) | 0.002 |
| 31-50 | | 15 (11.8) | 13 (92.9) | 21.4 (2.5-181.5) | 0.005 | 14.11 (1.56-127.58) | 0.018 | 18.14 (2.07-159.06) | 0.009 |
| >50 | | 47 (37.0) | 45 (95.7) | 37.0 (7.7-176.7) | <0.001 | 30.04 (5.65-159.63) | <0.001 | 36.37 (6.96-189.93) | <0.001 |
| PGY Level | 127 | | | | | | | | |
| PGY2/3 | | 76 (59.8) | 48 (64.0) | - | - | - | - | - | - |
| PGY4 | | 51 (40.2) | 45 (88.2) | 4.22 (1.59-11.2) | 0.004 | 3.24 (0.98-10.76) | 0.055 | 3.35 (1.01-11.10) | 0.048 |
| Program Size | 127 | | | | | | | | |
| 1-6 | | 92 (72.4) | 62 (67.4) | - | - | - | - | - | - |
| 7+ | | 35 (27.6) | 31 (88.6) | 3.63 (1.17-11.23) | 0.026 | 1.72 (0.39-7.56) | 0.47 | - | - |
| Teledermatology Didactics Received | 127 | | | | | | | | |
| No | | 32 (25.2) | 18 (56.3) | - | - | - | - | - | - |
| Yes | | 95 (74.8) | 75 (79.8) | 3.07 (1.3-7.26) | 0.011 | 3.94 (1.26-12.34) | 0.019 | 3.91 (1.26-12.63) | 0.019 |
| Presence of Teledermatology Rotation | 126 | | | | | | | | |
| No | | 87 (69.1) | 62 (71.3) | - | - | - | - | - | - |
| Yes | | 39 (30.9) | 30 (78.9) | 1.51 (0.61-3.75) | 0.37 | - | - | - | - |

3.91, 95% CI 1.26-12.63, P=0.02) also maintained significance. Residents who performed more cases were more likely to believe teledermatology would be important in their future practices (OR 3.08, 95% CI 1.23-7.72, P=0.02). Regardless of teledermatology exposure, residents did not consider the quality of care to be equal between teledermatology and in-person visits (P=0.74).

Almost 60% of residents and 80% of PD report resident participation in teledermatology, which is a significant increase from 21% reported by Qureshi and Mostaghimi in 2016 [5]. Residents are now more likely to indicate that teledermatology will be important in their future practices, especially those with more teledermatology exposure. The number of teledermatology cases performed most strongly

correlated with self-reported comfort, which was not just a result of advanced post-graduate year. Although the COVID-19 crisis has certainly changed resident participation in teledermatology, our data are useful because they suggest two actionable ways to increase resident comfort with teledermatology: increasing hands-on exposure to teledermatology cases and providing teledermatology didactics. Regardless of the number of cases performed, residents indicated the quality of care in teledermatology was not equal to that of traditional in-person visits, the cause of which requires further investigation. Study limitations include self-selection bias, recall bias, and subjectivity in self-reported comfort.

References

1. Chuchvara N, Patel R, Srivastava R, Reilly C, Rao B. The growth of teledermatology: expanding to reach the underserved. *J Am Acad Dermatol*. 2019;82:1025-33. [PMID: 31811880].
2. Carter ZA, Goldman S, Anderson K, et al. Creation of an internal teledermatology store-and-forward system in an existing electronic health record: a pilot study in a safety-net public health and hospital system. *JAMA Dermatol*. 2017;153:644-50. [PMID: 28423156].
3. Naka F, Lu J, Porto A, et al. Impact of dermatology eConsults on access to care and skin cancer screening in underserved populations: a model for teledermatology services in community health centers. *J Am Acad Dermatol*. 2018;78:293-302. [PMID: 29061478].
4. Rajda J, Seraly MP, Fernandes J, et al. Impact of direct to consumer store-and-forward teledermatology on access to care, satisfaction, utilization, and costs in a commercial health plan population. *Telemed JE Health*. 2018;24:166-69. [PMID: 28742431].
5. Qureshi S, Mostaghimi A. Exposure to teledermatology and resident preparedness for future practice: results of a national survey. *Dermatol Online J*. 2016;22(7):13030/qt20b8h76b.. [PMID: 27617731].

Teledermatology education is expanding in residency programs throughout the country and most residents and PD support increased teledermatology education. The COVID-19 crisis serves as a springboard for the utilization of telemedicine in more dermatology practices. Educational efforts to increase hands-on cases and teledermatology-specific didactics will prepare the future workforce to fully engage in a dynamic, access-oriented healthcare system.

Potential conflicts of interest

The authors declare no conflicts of interest.