Dermatology Practical & Conceptual

Innovations in Dermoscopy Training: A Comparative Analysis of Dermoscopy Training Educational Delivery Models for Resident Physicians

T. Austin Black[1], Emelie E. Nelson[1], Anthony J. Teixeria[2], Travis Anthony[3], Julie Simon[4], Kelly C. Nelson[5]

1 McGovern Medical School, University of Texas Health Science Center at Houston, Houston, TX, USA
2 Davidson College, Davidson, NC, USA
3 Department of Cancer Prevention & Control Platform, The University of Texas MD Anderson Cancer Center, Houston, TX, USA
4 Department of Surgical Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX, USA
5 Department of Dermatology, The University of Texas MD Anderson Cancer Center, Houston, TX, USA

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Corresponding Author: Kelly C. Nelson, MD FAAD, MD Anderson Cancer Center, 1400 Pressler St, Unit 1452, Houston, TX 77030. Email: kcnelson1@mdanderson.org

Introduction

DERMatology: Early Melanoma Detection (DERM:EMD) is a scalable, metric-driven educational intervention designed to improve dermatology resident physicians' confidence and accuracy in evaluating skin growths via dermoscopic examination. The program launched in 2017 and runs on an academic year calendar. While the program employed live synchronous delivery via *Zoom* from 2017-2020, the program transitioned to asynchronous web-based delivery with the 2020/21 academic year [1]. The web-based delivery utilized *Canvas* as the main educational platform with two additional educational software programs: *Knowbly* (enabled interactive data fields where residents click on specific dermoscopic features and receive feedback) and *Panopto* (enabled search for spoken or written word content and supported progress bars to assist with intuitive navigation through the lectures) [2-4]. We hypothesized the web-based delivery would be non-inferior to live delivery in supporting knowledge and confidence gains among dermatology residents.

Case Presentation

DERM:EMD employs two assessments: the Cutaneous Neoplasm Diagnostic Self-Efficacy Instrument (CNDSEI)

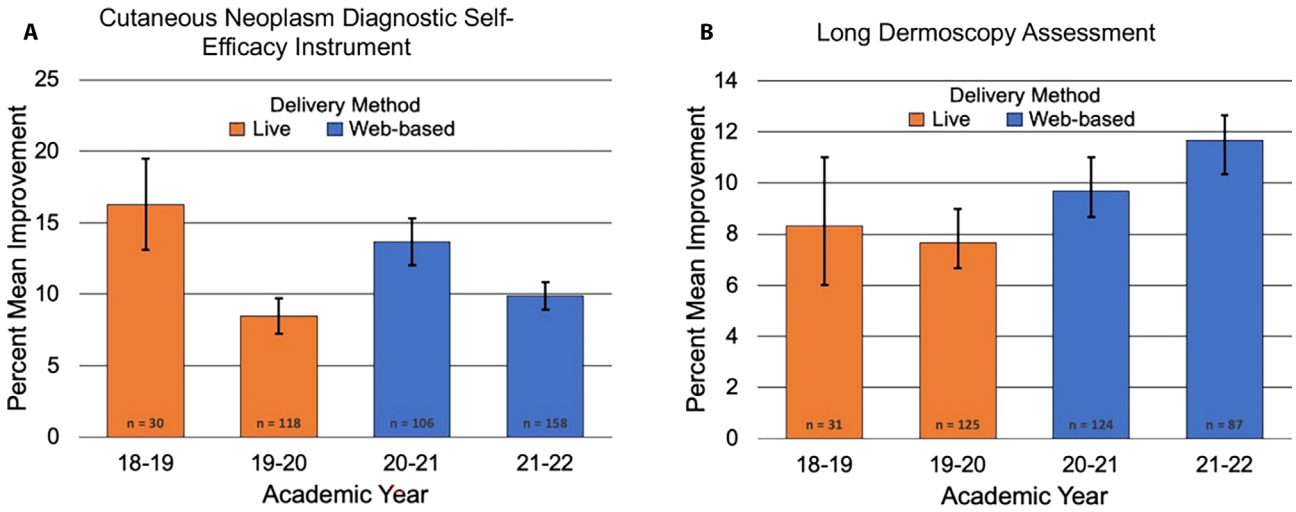

Figure 1. (A) Percent mean improvement from pre- to year-end in CNDSEI scores (self-efficacy). (B) Percent mean improvement from pre- to year-end in LDA scores (diagnostic accuracy).

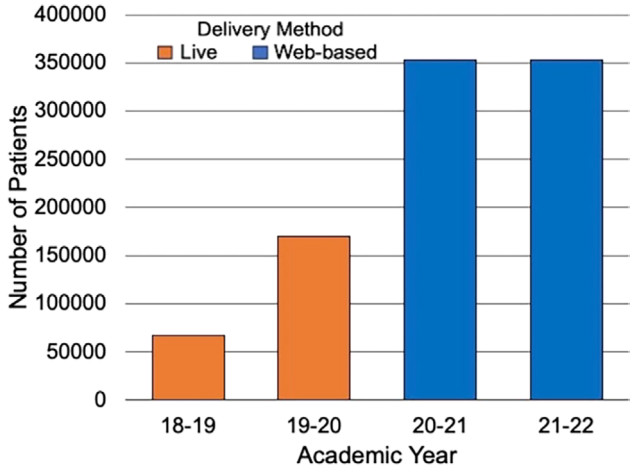

Figure 2. Potential number of patients impacted per academic year.

to measure confidence in diagnosing skin tumors via clinical or dermoscopic examination, and the Long Dermoscopy Assessment (LDA) to measure diagnostic accuracy [5]. Assessments are collected before and immediately after the educational exposure and at the end of the academic year to assess knowledge retention. While collection of the pre-exposure and year-end data has been consistent, completion rates for the immediate post-exposure data have varied significantly. As participants are encouraged to take the course multiple times throughout residency, only data derived from the first instance in which a resident completed both the pre- and year-end assessments within the same academic year were analyzed.

Scores collected at the course start and year-end were consolidated, and the percent mean improvement between live (2018/19, 2019/20) and web-based (2020/21, 2021/22) delivery years were compared. No difference was found in confidence gains when comparing the live and web-based delivery years (CNDSEI 10.04 vs 11.38, *P*=0.348, 95% CI: -21.54–7.61, Figure 1a). However, residents completing the web-based delivery demonstrated greater gains in diagnostic accuracy compared to the live-delivery residents (LDA 10.49 vs 7.8, *P*=0.049, 95% CI: -1.54– -0.002, Figure 1b).

Transitioning to a web-based asynchronous delivery model correlated with an expanded reach of DERM:EMD. In 2018/19, 10 dermatology residency programs participated in DERM:EMD; in 2022/23, 31 programs participated. This increase directly translates to the potential number of patients impacted by the course. At year-end, residents estimated the average weekly number of skin cancer patients they had cared for over the preceding month. This estimate was then multiplied by 47 to account for elective and vacation weeks, providing a conservative yearly approximation of patient reach (Figure 2). With the implementation of the web-based delivery method, the estimated patient reach more than doubled compared to live-delivery (237,797 vs. 706,575).

Conclusion

The web-based delivery supported greater outcomes over the live-delivery in two ways: first, the ability to revisit course material over time and accommodate diverse learning styles supported greater knowledge gains; second, the improved scheduling flexibility supported expanded programmatic, and therefore patient, reach. Similar delivery methods could be considered for other specialty dermatology residency education topics.

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