Dermatology Practical & Conceptual

Dermoscopy in Selected Latin American Countries: A Preliminary Look into Current Trends and Future Opportunities Among Dermatology Residency Programs

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ABSTRACT

Introduction: Skin cancer remains a global public health burden. Dermoscopy is a useful technique that aids in early detection and increases diagnostic accuracy with adequate training. However, dermoscopy is not uniformly taught to residents worldwide. Dermoscopy training in Latin American dermatology residency programs has not been explored.

Objectives: To assess current dermoscopy training among dermatology residency programs in Latin America (eg training modalities, preferred/most effective modalities per residents, diseases/pathologies taught).

Methods: Cross-sectional survey distributed via e-mail between March and May 2021. Chief residents from Argentina, Brazil, Colombia, Costa Rica, Chile, Ecuador, Guatemala, Mexico, Panama, and Uruguay were invited to participate.

Results: 81 chief residents completed the questionnaire (81/126, 64.2%). Seventy-two percent of programs had an established dermoscopy curriculum, with dedicated hours of training varying greatly by program. Institutions commonly utilized sessions with "unknown" dermoscopy images and direct teaching by experts in the clinical setting as supplements to lectures, also described by residents as most effective. The most commonly taught methods included pattern analysis (74.1%), the two-step algorithm (61.7%), and the ABCD rule (59.3%). Almost all respondents reported desiring additional training during residency and believe that dermoscopy training should be a requirement to graduate from residency.

Conclusions: This study highlights a preliminary look into current landscape in dermoscopy training among selected Latin American dermatology residency programs, demonstrating room for improvement and standardization in dermoscopic education and training. Our results serve as a baseline reference and provide valuable information to guide future educational initiatives incorporating successful teaching strategies (eg. spaced education/repetition, flipped classroom model) used in dermatology and other fields.

Introduction

Skin cancer continues to be a public health burden globally. Early detection remains the most cost-effective means of improving prognosis and reducing morbidity, mortality, and health-related costs [1-3]. Dermoscopy is a non-invasive, in-vivo imaging technique that allows for the visualization of subsurface structures of the skin that are otherwise not visible to the naked eye [4,5]. Dermoscopy increases the diagnostic accuracy for skin cancer, including melanoma, by up to 50% compared to the naked eye examination alone; however, this is contingent on adequate training [6,7].

Although dermoscopy has demonstrated its value in early detection of skin cancer, it is not uniformly taught to residents worldwide. Studies show that dermoscopy use among dermatology residents in Europe and Australia is on the rise [8-10]. Similarly, studies assessing the use of dermoscopy among dermatology residents in the United States (US) demonstrate that the majority of trainees are receiving didactic lectures and clinical training on the use of this tool in differentiating benign (eg nevi, seborrheic keratosis) from malignant lesions (eg melanoma, basal cell carcinoma, squamous cell carcinoma) [11]. Nevertheless, dermoscopy training continues to have one of the lowest satisfaction rates among residency programs [12,13].

Objectives

The use of dermoscopy among dermatology residents in Latin America has not been explored. The objective of this study was to better understand current dermoscopy training among dermatology residency programs in Latin America (eg types of training modalities, training modalities considered to be most effective by residents, preferred training modalities by residents, and the diseases/pathologies taught) as a first step toward the creation and implementation of educational and training initiatives.

Methods

We performed a cross-sectional study using an electronic anonymous survey. Only the chief residents of selected Latin American dermatology residency programs from Argentina, Brazil, Colombia, Costa Rica, Chile, Ecuador, Guatemala, Mexico, Panama, and Uruguay were invited to participate in the study. Only chief residents were invited to answer the survey, since they would be familiar with their curriculum and the educational practices of their institution. The survey was distributed via e-mail between March and May of 2021, and participation was voluntary. The survey was available in English, Spanish, and Portuguese on the online

Qualtrics® platform (Qualtrics, LLC, SAP America Inc. company). Multiple submissions were prevented by use of Qualtrics® software. Participating countries were selected by convenience sampling, based on availability of representative contacts. Based on the number of dermatology residency programs in each country, the estimated sample size was 126. Summary statistics and descriptive frequencies were collected using Microsoft Excel™. The study was approved by the Institutional Review Board at University of Miami.

Results

The response rate was 64.2% (81/126). Overall, 81 chief residents from dermatology residency programs in Brazil, Argentina, Colombia, Mexico, Chile, Ecuador, Guatemala, Panama, Uruguay, and Costa Rica completed the questionnaire (Table 1). Almost all respondents hailed from urban training programs.

Half of the participants (54%) reported receiving a dermatoscope from their institution (Table 2). The hybrid handheld dermatoscope (ie polarized and non-polarized light) was the most commonly used type of dermatoscope. All participants reported using a dermatoscope to aid in the detection of malignant tumoral pathologies such as melanoma, basal cell carcinoma, and squamous cell carcinoma.

Table 1. Participant demographics including location and country of residency.

Demographics	N (%)
All	81
Sex	
Female	64 (79.0)
Male	16 (19.8)
Other	1 (1.2)
Year of dermatology residency	
1st	5 (6.2)
2nd	7 (8.6)
3rd	56 (69.1)
Other	13 (16.0)
Location	
Urban	78 (96.3)
Suburban	2 (2.5)
Rural	1 (1.2)
Country	
Argentina	17 (21.0)
Brazil	29 (35.8)
Chile	4 (4.9)
Colombia	13 (16.0)
Costa Rica	1 (1.2)
Ecuador	2 (2.5)
Guatemala	2 (2.5)
Mexico	10 (12.4)
Panama	2 (2.5)
Uruguay	1 (1.2)

Table 2. Participant-reported current dermoscopy use.

Current dermoscopy use	N (%)
All	81
Daily dermatoscope use	
Yes	80 (98.8)
No	1 (1.2)
Dermatoscope type[a]	
Handheld dermatoscope, hybrid (polarized and non-polarized light)	69 (85.1)
Handheld dermatoscope adaptable to photo camera or smartphone	30 (37.0)
Specific device for digital dermoscopy	10 (12.3)
Handheld dermatoscope, only polarized light	4 (4.9)
Dermatoscope provided by institution	
Yes	44 (54.3)
No	37 (45.7)
Situations for dermatoscope use[a]	
To aid in melanoma detection	81 (100.0)
To aid in basal cell carcinoma detection	81 (100.0
To aid in squamous cell carcinoma detection	81 (100.0)
To aid in actinic keratosis detection	73 (90.1)
To aid in seborrheic keratosis detection	71 (87.7)
To aid in vascular neoplasm detection	74 (91.4)
To aid in diagnosing infectious skin conditions	56 (69.1)
To aid in differentiating cutaneous tumors from inflammatory dermatoses	70 (86.4)
To aid in hair diseases	79 (97.5)
To aid in nail diseases	68 (84.0)
Other: mucosal lesions, guided biopsy	5 (6.2)

[a]Multiple response (ie "select all that apply").

A large majority of participants also reported using dermatoscopes to assist in the diagnosis of hair diseases (97.5%), actinic keratoses (90.1%), vascular neoplasms (91.4%), seborrheic keratoses (87.7%), inflammatory dermatoses (86.4%), nail diseases (84.0%), and infectious skin conditions (69.1%). Other cited uses included guided biopsies and mucosal lesions.

Although almost all participants (99%) reported using a dermatoscope in their everyday clinical practice (Table 2), not all of them had a formal training program. Specifically, 72% reported an established dermoscopy training curriculum as part of the residency program, and hours of training varied greatly by institution (Table 3). Dermoscopy lectures frequently covered topics such as differentiation of nevi from melanoma, non-melanoma malignancies, benign lesions including seborrheic keratoses; facial lesions, acral lesions, and hair dermoscopy. Less commonly covered topics included mucosal lesions, nail dermoscopy, and inflammatory

Table 3. Participant-reported current dermoscopy training.

Current dermoscopy training	N (%)
Dermoscopy training is part of residency curriculum	
Yes	58 (71.6)
No	23 (28.4)
Hours of training per academic year	
0	9 (11.1)
1-5	9 (11.1)
5-10	10 (12.4)
10-20	15 (18.5)
20-30	9 (11.1)
>30	29 (35.8)
Topics covered in dermoscopy lectures[a]	
Differentiation of nevi from melanoma	73 (90.1)
Non-melanoma malignancies (ie basal cell carcinoma, squamous cell carcinoma)	71 (87.7)
Benign lesions (ie seborrheic keratoses, angiomas)	64 (79.0)
Skin infections	30 (37.0)
Inflammatory condition	32 (39.5)
Hair dermoscopy	53 (65.4)
Nail dermoscopy	39 (48.1)
Mucosae	27 (33.3)
Facial lesions	54 (66.7)
Acral Lesions	60 (74.0)
Other	4 (4.9)
N/A (do not receive dermoscopy lectures)	8 (9.9)
Dermoscopy sessions using images (aka "Kodachromes" or "unknowns") provided by institution	
Yes	51 (63.0)
No	29 (35.8)
No answer	1 (1.2)
Methods taught by institution[a]	
ABCD rule of dermoscopy	48 (59.3)
Menzies method	28 (34.6)
Pattern analysis or revised pattern analysis	60 (74.1)
7-point checklist	29 (35.8)
CASH algorithm (Colors, Architecture, Symmetry, Homogeneity)	10 (12.3)
Two-step algorithm	50 (61.7)
TADA (Triage Amalgamated Dermoscopy Algorithm)	8 (9.9.)
None	5 (6.2)
Other	3 (3.7)
No answer available	1 (1.2)
Use of other dermoscopy training resources	
No	20 (24.7)
No answer available	1 (1.2)
Yes	60 (74.1)
If answer to "use of other dermoscopy training resources" is yes, What are other resources used?[a]	
Online quizzes	32/60 (53.3)
Online lectures	41/60 (68.3)
Textbooks	53/60 (88.3)
Online text	43/60 (71.7)
Online forums/discussion groups	27/60 (45.0)
Other	4/60 (6.7)
Training by dermoscopy expert	
No	35 (43.2)
No answer available	2 (2.5)
Yes	44 (54.3)
Hours per month spent with dermoscopy expert in clinical setting	
1-5	15/44 (34.1)
5-10	7/44 (15.9)
10-20	10/44 (22.7)
20-30	2/44 (4.5)
>30	8/44 (18.2)
No answer available	2/44 (4.5)

[a]Multiple response (ie "select all that apply").

conditions. More than half of programs employed case-based sessions with dermoscopy images (63%) and direct teaching by a dermoscopy expert in the clinical setting (54.3%). Pattern analysis was the most commonly reported method (74.1%), followed by the two-step algorithm (61.7%) and the ABCD rule (59.3%). In addition to institutional lectures, sessions using dermoscopy images and expert training, 74% of respondents reported utilizing other dermoscopy training resources, such as textbooks and online material.

Almost all chief residents reported desiring additional training during residency (91.3%) and believe that dermoscopy training should be a requirement to graduate from residency (93.8%) (Table 4). Although the ideal training duration varied greatly among respondents, sessions using dermoscopy images, hands-on training with experts, and didactic lectures were regarded as effective teaching methods, followed by independent learning.

Table 4. Participant preferences for dermoscopy training.

Dermoscopy Training Preferences	N (%)
Additional dermoscopy training desired in residency	
Yes	74 (91.3)
No	3 (3.7)
No answer available	4 (4.9)
Dermoscopy training should be required to graduate residency	
Yes	76 (93.8)
No	1 (1.2)
No answer available	4 (4.9)
Most effective method of training[a]	
Sessions with dermoscopy images/cases (aka unknowns /Kodachromes)	66 (81.5)
Didactic lectures	57 (70.3)
Hands-on training with expert	66 (81.5)
Independent learning (online, textbook)	32 (39.5)
Other	3 (3.7)
Ideal duration of hands-on training	
Hours (mean ± sd)	(18.5 ± 40.2)
Days (mean ± sd)	(12.7 ± 21.7)
Ideal duration of in-person course	
Hours (mean ± sd)	(12.3 ± 11.6)
Days (mean ± sd)	(10.5 ± 13.3)
Ideal duration of online dermoscopy video	
Hours (mean ± sd)	(5.7 ± 11.2)
Sessions (mean ± sd)	(11.8 ± 13.3)

Sd = standard deviation.[a]Multiple response (ie "select all that apply").

Conclusions

Dermoscopy has proved to be a valuable instrument in the early detection of skin cancer, thus reducing morbidity, mortality, and health-related costs, while improving patient care and quality of life. The efficacy and thereby utility of this device, however, depends on adequate training [6,7]. Data shows that at least 62%-84% of dermatology residents in the US receive training during residency [13,14]. Residents in Europe have not been specifically studied, but surveys of practicing dermatologists show that at least 32%-42% received training during residency [15]. In Australia, dermoscopy education is a core part of residency training, with all residents receiving formal didactic training and most programs providing dermatoscopes for resident use [16]. In our study, almost all surveyed residents from Latin American dermatology programs reported using a dermatoscope in their everyday practice in a variety of clinical contexts, but only half reported receiving a dermatoscope from their training program. Dermoscopy was formally included in the didactic curriculum of more than two thirds of programs (72%), with lectures spanning a broad range of topics, including differentiation of nevi from melanoma and non-melanoma malignancies.

Given the different modalities for teaching dermoscopy and associated learning preferences, in addition to understanding the current landscape of dermoscopy use among trainees in a given region, it is also important to understand the modalities taught, the effectiveness of these strategies, and the trainee learning preferences before embarking on larger dermoscopy education initiatives. Among the surveyed residents, pattern-analysis was taught in 74% of programs, followed by the two-step algorithm (61.7%) and the ABCD rule (59.3%). Institutions employed the use of lectures, sessions with dermoscopy images, and expert training, though 74% of residents reported utilizing supplemental training resources such as textbooks and online content. Importantly, almost all residents believed dermoscopy training should be a requirement for graduation and desired additional training than they were currently receiving.

There is limited evidence in the literature regarding specific approaches to dermoscopic education and their long-term efficacy. At one US institution, a flipped classroom approach for dermoscopic education (students review preparatory instructional content outside the classroom and participate in faculty-guided active learning within the classroom) was suggested to improve satisfaction and learning by promoting accountability, though data was mostly anecdotal

[17]. In France, a spaced-education internet dermoscopy module (involving question-based educational content with spaced repetition as well as an adaptive rescheduling algorithm) combined with in-class training implemented in dermatologists and senior residents led to improved performance and learning retention compared to in-class training alone [18]. In Belgium, a two-stage training course taught by experts (consisting of a 3-hour basic course followed by a 3-hour advanced course six weeks later) improved diagnostic accuracy in residents even more than practicing dermatologists and showed sustained effects in learning [19]. These and other teaching strategies have also been employed with success in various medical specialties, including online spaced-education in urology and cardiology, and mobile app technology with spaced repetition in otolaryngology [20-22].

Limitations of the study include a low response rate (64%), which could represent lack of interest in the study or in dermoscopy, but can be expected with anonymous surveys. Further, the evaluation of dermoscopic education practices of each institution was based on responses from a single resident (ie chief resident) and therefore may represent only a single opinion. In addition, the length of training programs is not standardized between countries and may impact the amount of dermoscopy training provided. Last, the convenience sampling (ie surveying chief residents from countries selected based on available representative contacts) impedes generalization of survey results and may result in biased data due to underrepresentation of the population. Of note, the total number of residents of all years represented by the survey amounts to more than 1,300; though specific information regarding the precise number of residents in each program and each country was not available for all countries. Therefore, these results can be considered preliminary and may be improved upon with a larger and more representative sample.

In summary, our study, though limited by small sample size and potential selection bias, provides initial insight into the current landscape and preferences in dermoscopy training among dermatology residency programs in Latin America, demonstrating room for improvement and standardization in dermoscopic education and training. Our results serve as a baseline reference and provide valuable information to guide future educational initiatives, which can include successful teaching strategies (eg spaced education/repetition, flipped classroom model) in dermatology and other fields.

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