ORIGINAL RESEARCH

Medical Students' Perceptions of Dermatology Education

[1]Regina Liu, BA, [2]Nicholas Jackson, PhD, MPH and [1]Marcia Hogeling, MD

[1]Division of Dermatology, Department of Medicine, David Geffen School of Medicine, University of California, Los Angeles
[2]Department of Medicine Statistics Core, David Geffen School of Medicine, University of California, Los Angeles

Introduction

There is minimal time allocated for dermatology courses in medical school. As little as 10 hours of formal dermatology instruction is included in the pre-clerkship curriculum.[1,2]

Cutaneous diseases are very common and account for a significant portion of clinical visits in healthcare.[3] Up to a fourth of all visits to a primary care physician are for dermatologic complaints.[4] A 2001 study found as many as 60% of dermatologic conditions are managed by nondermatologists.[3] This is especially true in many rural parts of the U.S. where there is a shortage of dermatologists.[5,6] Thus, students pursuing specialties other than dermatology, especially those in primary care, need adequate training in managing dermatologic conditions. Experts have long advocated for more dedicated time for dermatology instruction in the undergraduate medical curriculum.[7-9] However, determining how to most effectively integrate more dermatology teaching into the curriculum is a challenge.

Feedback from medical students is commonly used to identify areas in need of improvement and to create strategies to optimize their learning. We believe this is the first US survey investigating medical student perceptions of dermatology education in both pre-clinical and clinical years. Previous surveys of medical students have focused on student learning in dermatology clerkships.[10] However, few schools incorporate mandatory dermatology clerkships.[11] While most medical schools offer elective clinical dermatology rotations, only 25% to 30% of students participate in these elective rotations.[8]

We aimed to (1) characterize medical student perceptions of dermatology instruction in undergraduate medical education and (2) assess student confidence and competence with common dermatologic conditions. The findings will be useful in making improvements in curriculum development.

Methods

The study was reviewed and certified exempt from the University of California Los Angeles Institutional Review Board (IRB#18-002032).

Full-time, graduating students at 13 medical schools across the U.S. were recruited to participate. Recruitment media included email and social media postings, distributed toward the end of the academic year (February to April 2020). Eligible participating students were asked to complete a survey consisting of two parts: (1) a questionnaire and (2) a proficiency assessment.

The 15-item questionnaire asked students to describe their medical school curricula, including the number of hours dedicated to dermatology teaching and the teaching methods employed. The students were then asked for their opinions on (1) whether they wanted more time dedicated for dermatology teaching in their curriculum and (2) whether their current curriculum adequately prepared them in dermatology. Students were also asked to report their confidence levels diagnosing and treating selected dermatologic conditions. Answers were based on a Likert scale (ie, 5 = not confident at all, 1 = extremely confident). The questionnaire also gauged the students' preferred learning methods. Finally, the questionnaire collected information including the student's medical school, demographic information, and planned residency specialty.

The proficiency assessment consisted of 20 multiple choice questions designed to test student knowledge of important dermatologic conditions. The questions were based on the American Academy of Dermatology's (AAD's) core online curriculum for medical students.[11] A board-certified dermatologist reviewed the assessment for quality and accuracy.

Descriptive statistics (e.g. means and SDs or frequencies) are presented for the sample. Associations between medical school curricula and the proficiency assessment were conducted using a mixed effects logistic regression model with person random intercept.

Results

Respondent Characteristics

Of the 158 students who responded to the recruitment media, 110 graduating medical students (69.6%) completed the survey. One student was excluded for not meeting the inclusion criteria of having status as a graduating student. The students represented 14 specialties and 13 medical schools across the U.S.

Table 1. Respondent characteristics, including medical school, gender, and specialty.

Characteristic	Values
Age (years), *(N) mean ± SD*	(106) 27.3 ± 2.0
Gender, *(N) %*	
Female	(66) 61.7%
Male	(41) 38.3%
Ethnicity, *(N) %*	
White	(47) 44.8%
Hispanic	(9) 8.6%
Black	(8) 7.6%
Asian	(33) 31.4%
Native American	(1) 1.0%
Other	(7) 6.7%
Medical School Attended, (N) %	
Saint Louis University	(10) 9.1%
Dartmouth	(4) 3.6%
West Virginia University	(10) 9.1%
Brown University	(6) 5.5%
University of North Carolina	(9) 8.2%
University of Texas	(24) 21.8%
University of Vermont	(5) 4.5%
State University of New York	(4) 3.6%
University of California Los Angeles	(25) 22.7%
Charles Drew University	(1) 0.9%
University of Southern California	(3) 2.7%
University of Arizona	(4) 3.6%
Unknown	(5) 4.5%
[1]Specialty, (N) %	
Internal medicine	(26) 24.3%
Family medicine	(15) 14.0%
Pediatrics	(13) 12.1%
Dermatology	(5) 4.7%
Emergency medicine	(11) 10.3%
General surgery	(3) 2.8%
Psychiatry	(10) 9.3%
Orthopedic surgery	(0) 0.0%
Ob/gyn	(10) 9.3%
Radiology	(3) 2.8%
Ophthalmology	(1) 0.9%
Anesthesiology	(5) 4.7%
Plastic surgery	(1) 0.9%
Neurology	(2) 1.9%
PM&R	(0) 0.0%
Pathology	(4) 3.7%
Other	(8) 7.5%
Unknown	(3) 2.7%
[1]More than one specialty could be selected by each participant	

Student Perceptions of Dermatology Curriculum

Students reported an approximate mean of 15 hours of formal dermatology teaching in their respective medical school curricula with a confidence interval of 10 to 30 hours. Ninety-three percent of those hours were accounted for in their pre-clinical curriculum. Students reported teaching primarily occurred via lecture, online modules, problem-based learning, team-based learning, case-based learning, elective clinical rotations, and flipped classroom. Additionally, 57.7% (n = 45) of respondents reported using independent study to learn dermatology.

Table 2. Medical student perceptions on formal dermatology instruction.

Characteristic	Values
Hours of Training, *(N) median [IQR]*	(95) 15.0 [10.0, 30.0]
Preclinical Hours of Training, *(N) median [IQR]*	(95) 12.0 [8.0, 20.0]
Proportion of Hours that were preclinical, *(N) median [IQR]*	(94) 0.925 [0.750, 1.000]
Use Outside Learning Methods, *(N) %*	
No	(32) 41.6%
Yes	(45) 58.4%
Views on Training Q1: There should be more time dedicated to formal instruction	
(N) mean ± SD	(104) 2.82 ± 1.43
Strongly Agree, *(N) %*	(18) 17.3%
Agree, *(N) %*	(33) 31.7%
Somewhat Agree, *(N) %*	(24) 23.1%
Neutral, *(N) %*	(16) 15.4%
Somewhat Disagree, *(N) %*	(6) 5.8%
Disagree, *(N) %*	(6) 5.8%
Strongly Disagree, *(N) %*	(1) 1.0%
Views on Training Q2: Current curriculum adequately trains me in dermatology	
(N) mean ± SD	(105) 4.40 ± 1.46
Strongly Agree, *(N) %*	(1) 1.0%
Agree, *(N) %*	(8) 7.6%
Somewhat Agree, *(N) %*	(28) 26.7%
Neutral, *(N) %*	(13) 12.4%
Somewhat Disagree, *(N) %*	(28) 26.7%
Disagree, *(N) %*	(20) 19.0%
Strongly Disagree, *(N) %*	(7) 6.7%
Where would you like to see your preferred learning method implemented, *(N) %*	
Pre-Clinical Years	(22) 21.0%
Internal Medicine Clerkship	(10) 9.5%
Family Medicine Clerkship	(34) 32.4%
Pediatric Clerkship	(4) 3.8%
Mandatory Dermatology Clerkship	(2) 1.9%
Elective Dermatology Clerkship	(19) 18.1%
Online	(7) 6.7%
Other	(7) 6.7%
IQR = Interquartile range	

Student Confidence and Competency

Fifty-seven students rated their confidence levels with diagnosing and treating select dermatologic conditions (**Figure 1**). Students who reported higher confidence levels in diagnosis

and treatment scored better on the assessment (Odds Ratios (OR) = 1.25 and 1.2, $p < 0.01$). Assessment scores were also higher for students who received more dermatology training (OR=1.45, $p < 0.01$) and studied dermatology independently outside of their formal curricula (OR=1.2, $p < 0.01$).

Discussion

In recent years, a number of medical schools have been redesigning their curricula to implement innovative teaching methods.[12-16] As medical education evolves, it is important for schools to consider how to incorporate more dermatology teaching in their new curricula.

Our study has several significant findings. First, a majority of students felt that their current curricula did not adequately train them in dermatology. These findings are consistent with studies that assess confidence navigating dermatologic conditions among healthcare providers later in their careers as residents and attending physicians. A study in 2009 found that less than 40% of the surveyed community-based primary care physicians in California felt that their medical school curriculum adequately prepared them to diagnose skin disorders.[17] Another study among internal medicine residents in Canada found that greater than 80% were uncomfortable or very uncomfortable in diagnosing and treating dermatological issues.[18] Our data suggests that the recognized discomfort with management of dermatologic conditions experienced by primary care providers begins as early as medical school.

A majority of students favored the inclusion of more formal dermatology didactics in their curricula. According to student report, medical schools are currently utilizing lecture, online modules, problem-based learning, team-based learning, case-based learning, and elective clinical rotations as the primary methods for disseminating dermatology teaching. The vast majority of dermatology curriculum occurs during the pre-clinical years. Students in our survey favored including more dermatology curriculum by having more elective dermatology clerkships and by incorporating dermatology teaching into existing family medicine and internal medicine clerkships. Notably, students were generally not in favor of having a mandatory dermatology clerkship.

The data on student confidence levels also offers guidance on which specific topics in dermatology need more representation in the curriculum. On average, students reported the lowest confidence levels with diagnosing basal cell carcinoma, melanoma, and actinic keratosis and with treating psoriasis, actinic keratosis, and infantile hemangiomas. Conversely, students felt most confident with diagnosing psoriasis, acne and rosacea, and seborrheic keratosis and treating bacterial skin infections, contact dermatitis, and atopic dermatitis. Notably, students felt less confident with treatment than diagnosis across all conditions.

Our study has a number of limitations. We surveyed a small number of medical students at a limited number of medical schools. The responding students may not be representative of the student body. The data is subject to recall bias given that students were asked to self-report information about their dermatology curriculum. Students were not able to provide qualitative explanations for their answers, for instance with regard to why they preferred certain learning methods or why they felt more didactics should occur through certain methods. When applying the findings of these studies to practical curricular reforms, instructors may consider conducting surveys or focus groups within their institutions to gather more informative feedback specific to their own subset of students.

Conclusion

Our study suggests that the proposed increase in dermatology teaching in undergraduate medical education would be well-received by students. There is encouraging data that the number of hours of dermatology teaching that students perceived in their medical school curricula was significantly correlated with higher assessment scores. Additions to the curriculum should target conditions identified in this study as being particularly challenging to students including but not limited to basal cell carcinoma and melanoma. Further smaller scale needs assessments may be helpful in guiding curriculum reform at a particular institution.

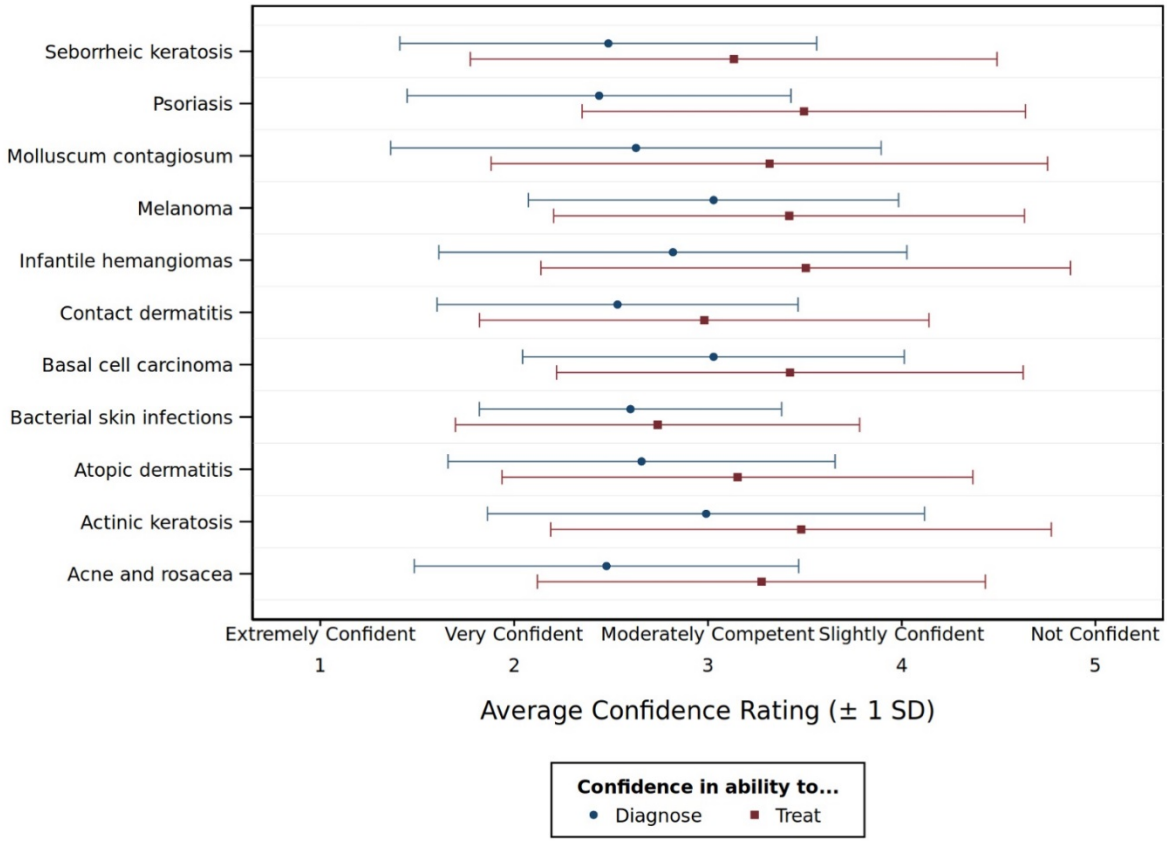

Figure 1. Medical student confidence levels with diagnosing and treating common dermatologic conditions.

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