A resident-as-teacher program increases dermatology residents' knowledge and confidence in teaching techniques: A pilot study

To the Editor: Dermatology residents play an important role in teaching medical students and colleagues, yet only approximately half of residency programs offer teaching methodology instruction to residents.[1] Formal teaching curricula for residents, or resident-as-teacher [RAT] programs, have been implemented in internal medicine, pediatrics, surgery, anesthesia, emergency medicine, and obstetrics and gynecology,[2-4] yet no similar programs for dermatology residents have been described. This study assessed the effect of an RAT program on

Table I. Average Likert scale responses to questions on the pre, post, and post-post surveys*

Variable†	Pre-test (n = 35)	Post-test (n = 35)	Post-post (n = 15)	*P* value, comparing pre to post‡	*P* value, comparing pre to post-post‡
Enjoyment of teaching					
Overall	4.5 ± 0.7	4.6 ± 0.6	4.3 ± 0.7	.190	.773
Lecturing	4.0 ± 1.0	4.1 ± 0.8	4.3 ± 05	.945	.059
Small group	4.3 ± 0.7	4.6 ± 0.6	4.1 ± 1.0	.045	.608
In clinic	4.2 ± 0.8	4.3 ± 0.8	4.0 ± 1.0	.235	.317
At bedside	4.3 ± 0.8	4.3 ± 0.7	4.2 ± 0.8	.808	.763
Average enjoyment§	4.3 ± 0.5	4.3 ± 0.5	4.2 ± 0.5	.975	.476
Knowledge					
Adult learning theory principles‖	2.0 ± 1.1	4.0 ± 0.5	3.8 ± 0.7	<.001	.001
The characteristics of effective teachers	3.3 ± 0.9	4.5 ± 0.5	4.1 ± 0.7	<.001	.002
The educational contract¶	1.7 ± 1.0	4.3 ± 0.6	3.9 ± 0.8	<.001	.001
Interactive lecture techniques	2.9 ± 0.9	4.1 ± 0.5	4.1 ± 0.5	<.001	.001
Small group participation techniques	2.8 ± 0.8	4.6 ± 0.6	4.0 ± 0.4	<.001	<.001
Teaching in the clinic	3.0 ± 0.9	4.3 ± 0.6	3.7 ± 0.7	<.001	.012
The one-minute preceptor#	2.0 ± 1.1	4.4 ± 0.6	3.6 ± 0.6	<.001	.001
Teaching at the bedside	3.0 ± 0.9	4.1 ± 0.7	3.9 ± 0.6	<.001	.007
Average knowledge§	2.6 ± 0.7	4.3 ± 0.4	3.9 ± 0.5	<.001	.001
Confidence					
Establish a positive learning environment	3.8 ± 0.6	4.6 ± 0.6	4.4 ± 0.7	<.001	.030
Get to know your learners	3.3 ± 0.6	4.6 ± 0.5	4.3 ± 0.7	<.001	.002
Complete an educational contract	1.9 ± 1.0	4.4 ± 0.6	4.1 ± 0.8	<.001	.001
Deliver an effective lecture	3.5 ± 0.7	4.1 ± 0.6	4.2 ± 0.6	<.001	.002
Deliver an interactive lecture	3.4 ± 0.9	4.1 ± 0.6	4.0 ± 0.5	<.001	.007
Keep an audience engaged	3.3 ± 0.7	4.0 ± 0.6	4.0 ± 0.5	<.001	.004
Run a small group case-based discussion	3.3 ± 0.8	4.3 ± 0.5	3.7 ± 0.9	<.001	.013
Ask appropriate questions	3.3 ± 0.7	4.4 ± 0.6	4.1 ± 0.5	<.001	.004
Encourage participation in a small group	3.3 ± 0.8	4.4 ± 0.5	4.1 ± 0.5	<.001	.002
Teach in the clinic	3.4 ± 0.7	4.2 ± 0.6	3.9 ± 0.9	<.001	.030
Teach at the bedside	3.4 ± 0.8	4.3 ± 0.6	3.9 ± 1.1	<.001	.025
Teach in a time crunch	2.6 ± 0.9	3.8 ± 0.7	3.4 ± 0.9	<.001	.015
Average confidence§	3.2 ± 0.4	4.3 ± 0.4	4.0 ± 0.5	<.001	.001
Other					
Academic job after residency	4.3 ± 0.6	4.4 ± 0.6	4.3 ± 0.7	.405	.651
Teaching after residency	4.4 ± 0.8	4.7 ± 0.6	4.5 ± 0.6	.059	>.99

*Likert scale responses range from 1 to 5, with 1 being "not at all enjoying/knowledgeable/confident" and 5 being "really enjoying/knowledgeable/confident."
†Data are presented as the mean ± standard deviation.
‡Wilcoxon signed rank test for paired samples.
§Comparison of the average Likert scale responses of all questions in the corresponding domain.
‖Adult learning theory is based on 4 principles: (1) adult learners have a well-established sense of self, (2) past experiences are important in learning, (3) learning is purpose driven, and (4) learning depends on readiness to learn.
¶An educational contract is a negotiated agreement between teacher and learner that addresses needs, expectations, roles, and content.
#The One-Minute Preceptor is a teaching technique whereby the preceptor provides feedback at the end of a trainee's presentation through 5 microskills: (1) get a commitment, (2) probe for supporting evidence, (3) reinforce what was done well, (4) give guidance about errors and omissions, and (5) teach a general principle.

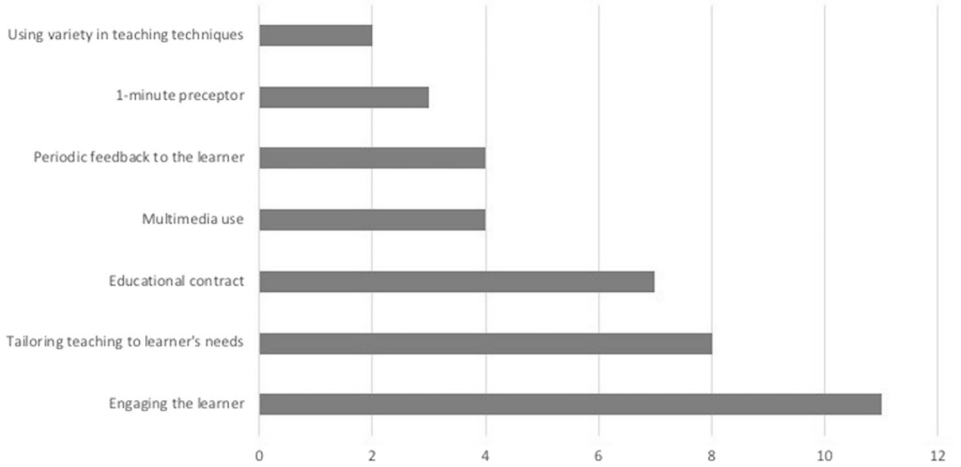

Fig 1. Frequency of various teaching skills mentioned as being implemented in the free response question at 3 or 9 months (n = 15).

dermatology residents' self-reported teaching knowledge, skills, and enjoyment.

The RAT program of the Harvard Combined Dermatology Residency Program, from 2012 to 2017, comprised four 90-minute interactive instructional sessions and a practical component where residents received a teaching observation conducted by an expert educator on their small-group case-based teaching for medical students. Residents on the Beth Israel Deaconess Medical Center consult rotation and "Teach 2" rotation (month-long rotation comprising teaching opportunities and specialized clinics) received this curriculum. The instructional sessions focused on adult learning theories and best practices for teaching in various settings, including large- and small-group teaching, teaching with patients, and teaching a procedural skill.

Surveys consisted of 27 questions on a 5-point Likert scale and 2 free response questions and assessed teaching enjoyment, knowledge, confidence, and likelihood of choosing an academic job after residency. Survey responses were anonymous and coded to compare before (pre), immediately after (post), and 3 to 9 months after (post-post) the program.

Over 5 years, 35 residents participated in this program, and 35 pre (100% response rate), 35 post (100%), and 15 post-post (43%) surveys were analyzed. A total of 8.6% of participants were post-graduate year (PGY) 2, 71.4% were PGY3, 17.1% were PGY4, and 2.9% were PGY5 (combined dermatology/medicine residents).

After the RAT program, there was a significant increase in all aspects of knowledge (+1.7 average, $P < .001$) and confidence in teaching (+1.1 average, $P < .001$), but no significant difference in enjoyment of teaching or in the likelihood of obtaining an academic or teaching job after residency (Table I). Residents reported greatest improvement in knowledge of adult learning theory principles (+2.0, $P < .001$), the educational contract (+2.6, $P < .001$), and One-Minute Preceptor (+2.4, $P < .001$) (Table I). Increase in knowledge and confidence were sustained in the post-post survey. Teaching skills that the residents applied the most were those aimed at engaging the learner and tailoring their teaching goals to the students' needs (Fig 1).

To our knowledge, this study is the first documented implementation of an RAT program in a dermatology residency curriculum, and it demonstrates that the RAT program increases residents' knowledge and confidence in teaching, with sustained effects 9 months after the program. The areas in which residents felt they improved the most were in specific teaching techniques, such as the educational contract and One-Minute Preceptor. Scores of teaching enjoyment and likelihood of obtaining an academic job after residency did not significantly increase. These scores were high to begin with, and curricular content did not specifically address these domains, but perhaps a longer program with components over the course of residency might influence these domains.

Future studies examining further objective measures of program effect and RAT effects in more institutions are warranted. Dermatology programs should consider implementing RAT programs to enhance dermatology residents' teaching knowledge and skills.

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YouTube as a source of dermatologic information on isotretinoin

The medical information on YouTube, the largest online video-sharing platform in the United States, is largely inadequate, given the lack of quality control of its content.[1,2] Isotretinoin is a highly monitored medication with potentially serious adverse effects and is widely administered to the most common age demographics of YouTube users.[3,4] The objective of this study was to assess the quality of medical information in the 50 most popular YouTube videos pertaining to isotretinoin for acne vulgaris. We hypothesize that the majority of YouTube videos related to isotretinoin contain poor-quality medical information.

Queries for "Accutane" and "isotretinoin" on http://www.youtube.com were performed on February 2, 2019 (Fig 1). The top 50 most-viewed videos meeting inclusion criteria were included in the final analysis. The total number of views served as a proxy for video popularity. The content quality of videos was graded by 2 independent reviewers according to 5 predetermined categories. Each category was given a rating of good (3 points), fair (2 points), poor (1 point), or not mentioned (0 points) (Supplementary Table I available via Mendeley at https://doi.org/10.17632/993bjcpb3n.3). The combined score for each video determined the overall quality of medical information (good 10-15 points; fair 5-9 points; and poor 0-4 points). Any disagreements were arbitrated by a board-certified dermatologist. The association between video popularity and information quality was assessed with Pearson correlation coefficients, and an unequal-variance *t* test was used to compare the mean number of views between good- and poor-quality videos.

The top 50 videos totaled 25,754,580 views during 10.8 years, and the top 7 videos contained 66% of all views (Table I). Dry skin (74%) and dry lips (58%) were the most common adverse effects reported, followed by sunburn/photosensitivity (28%), depression (26%), joint pain (24%), and mood lability (22%). Laboratory monitoring was mentioned in 22 videos (44%), of which 59% described general blood tests, 27% liver function tests, and 9% serum triglycerides tests. The iPLEDGE program was mentioned in 4 videos (8%). The majority of videos had fair- (54%) or poor-quality (32%) medical information. Although video popularity did not correlate with the overall quality of medical information ($P = .47$), poor-quality videos had a higher mean number of views than good-quality ones ($P = .02$).

The top 50 most-viewed videos related to isotretinoin totaled nearly 25.8 million views and contained predominantly fair- or poor-quality medical information. Although poor-quality videos had higher mean number of views than good-quality ones, video popularity did not correlate with the overall quality of medical information. The skewed distribution of views toward the 7 most popular videos suggests there may be a positive-feedback loop, with viewers preferring more popular videos.

This study was limited by its small sample size and use of nonvalidated criteria to objectively assess videos. Moreover, we did not consider other social media platforms that also present medical information in a nonpeer-reviewed fashion. Because of the relative lack of videos with good-quality information on isotretinoin, we recommend that patients view YouTube videos on isotretinoin cautiously and