DERM Digital Toolkit for Pediatric Residencies: an intervention and critique

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Introduction

- With such limited dermatology residencies, it is pertinent to have many other specialty providers also competent in dermatology
- 80% of primary care pediatricians report a limited supply of pediatric dermatologists to meet their demands[1]
- Approximately 30% of annual pediatric outpatient visits are related to a skin complaint[1,2]
- In one study, there was an 80.1% discordance between dermatologists and pediatricians' diagnoses[2]
- According to the ACGME, pediatric residency objectives only require four educational units from a list of thirteen optional subspecialties[5]
- To be proficient in dermatology as a trained pediatrician, it is estimated that approximately 768 hours need to be utilized toward dermatology in these residencies[2]
- Our goal is to:
  - Unify the four principle dermatological competencies: describe, evaluate, recognize, and manage (DERM) across pediatric residencies in hopes of increasing proficiency
  - Integrate more dermatology exposure into these programs
  - Discover underlying etiologies in residency's resistance to changing traditional curriculums

Methods

With IRB approval and informed consent, a prospective observational study with pre- and post-questionnaires was performed on two Northeast Ohio pediatric residency programs. It measured competency, confidence, and skillset in describing, diagnosing, and managing common pediatric dermatology. Exclusion criteria included residents who did not partake in both pre- and post-questionnaires. N = 14.

The variables evaluated included:

1. Training exposure in medical school
2. Training exposure in residency
3. Utilization in specific point of care technologies for dermatology
4. Utilization in the digital toolkit given over a one-month trial
5. Comfort level in recommending toolkit to other primary care residents

Non-respondents and residents who only completed one of the two surveys were excluded.

Statistical analysis included a paired sample t-test to compare the mean for pre-test and post-test results. Frequency of utilization for the DERM tools was measured on a percentage-scale, in 25% intervals, reported as proportions. The level of significance was set at $p<0.05$.

Results

- 9.2% of pediatric residents responded to the initial pre-survey (n=14)
- Out of the initial respondents, 64% responded to the post-survey (n=9)
- 71.4% reported only receiving 6 or less hours of training in dermatology during preclinical years
- 64.3% did not have any dermatologic rotation during clerkship years
- 71.4% reported not having rotated on a dermatology service thus far in residency
- 64% agreed or strongly agreed that there is not enough dermatologic education in their pediatric residency curriculum
- Most reported using Google and UpToDate as their main point of care technologies
- 57.1% and 64.3% were aware of VisualDx and Merck Manual, respectively but had not used these applications before surveys
- From the post-survey responses, 88.9% of residents reported using these applications 0% of the time

Pre-Survey

Table 1: Presurvey Results of Pediatric Residents (Reported as Frequency of Respondents [%])	n=14
Training in Dermatology	
There is not enough dermatology in my pediatrics residency curriculum	
Strongly Disagree/Disagree	1 (7.1%)
Neutral	4 (28.6%)
Strongly Agree/Agree	9 (64.3%)
Total hours of dermatology received in the first two years of medical school lectures	0 (0%)
<1	3 (21.4%)
1-2	5 (35.7%)
3-4	2 (14.3%)
5-6	4 (28.6%)
7 or more	
Weeks spent rotating in dermatology during third and fourth years of medical school	9 (64.3%)
0	0 (0%)
1	0 (0%)
2	0 (0%)
3	5 (35.7%)
4 or more	
Weeks spent rotating in dermatology outpatient or inpatient thus far during residency	10 (71.4%)
0	1 (7.1%)
1	1 (7.1%)
2	0 (0%)
3	2 (14.3%)
4 or more	
Use of Digital Tools	
Point of care technologies currently used for dermatological conditions (check all that apply)	14 (100%)
Google	13 (92.9%)
UpToDate	2 (14.3%)
Visual DX	3 (21.4%)
PubMed	
Information tool(s) consulted for dermatological conditions outside of point of care (check all that apply)	10 (90.9%)
Google	10 (90.9%)
UpToDate	2 (14.3%)
Visual DX	3 (21.4%)
PubMed	
How familiar are you with VisualDx?	
Used VisualDx	1 (7.1%)
Aware of VisualDx, but never used	8 (57.1%)
Never heard of VisualDx	5 (35.7%)
How familiar are you with Merck Manual?	
Used Merck Manual	2 (14.3%)
Aware of Merck Manual, but never used	9 (64.3%)
Never heard of Merck Manual	3 (21.4%)

Post-Survey

Table 2: Postsurvey Results of Pediatric Residents	n=9
In the past 4 weeks, how often did you use VisualDx when encountering a patient with a dermatological condition? (percentage of time)	8
0%	(88.9%)
25%	1
50%	(11.1%)
75%	0 (0%)
100%	0 (0%)
	0 (0%)
In the past 4 weeks, how often did you use Merck Manual when encountering a patient with a dermatological condition? (percentage of time)	8
0%	(88.9%)
25%	0 (0%)
50%	1
75%	(11.1%)
100%	0 (0%)
	0 (0%)
I would be comfortable recommending VisualDx as a useful resource for dermatologic conditions to other primary care residents.*	2.75 (1.6)
I would be comfortable recommending Merck Manual as a useful resource for dermatologic conditions to other primary care residents.*	3.13 (1.0)

Conclusion

- Majority of pediatric residents revealed a lack of education in dermatology in all stages of medical training
- This becomes detrimental when majority of basic dermatologic manifestations are seen in primary care offices, but only dermatologists receive proficient training in this
- Potential etiologies for the underutilization of toolkit:
  - Cognitive overload, limiting the ability to learn new information in residency[6]
  - "A sense of futility or fear of confrontation that maintains the silence and resistance to change course"[7]
  - The hidden curriculum, "a set of influences that function at the level of the organizational structure and culture to impact the learning environment"[7]
  - Uncertainty, denial, or the acceptance of current training[8]
  - Self-interest outweighs a desire for change, without realizing its implications[8]
- Potential reasons for low post-survey response include:
  - Survey-fatigue and/or limited time to fill out surveys
  - Restricted duration to utilize the toolkit
  - Limited leadership buy-in
- For the future:
  - A larger study with compensatory incentive and/or sufficient time to utilize dermatology applications
  - More studies to analyze traditional curriculums and advise comprehensive medical education to prepare physicians in evidence-based practices likely to be encountered

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