

Examining the factors associated with past and present dermoscopy use among family physicians

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Key words: dermoscopy, dermatoscopy, epiluminescence microscopy, family physicians, primary care

Citation: Morris JB, Alfonso SV, Hernandez N, Fernández MI. Examining the factors associated with past and present dermoscopy use among family physicians. *Dermatol Pract Concept* 2017;7(4):63-70. DOI: <https://doi.org/10.5826/dpc.0704a13>

Received: May 5, 2017; **Accepted:** July 15, 2017; **Published:** October 31, 2017

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Funding: Funding for the NSU research fellowship program was obtained by internal university funds.

Competing interests: The authors have no conflicts of interest to disclose.

All authors have contributed significantly to this publication.

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ABSTRACT **Introduction:** Family physicians (FPs) play a critical role in the early detection of skin cancers. Dermoscopy can improve diagnostic accuracy but its use by FPs in the United States (US) remains understudied.

Objectives: To examine dermoscopy use, factors associated with ever having used (Model 1) and currently using the dermascope (Model 2), and barriers.

Methods: We recruited 705 practicing FPs in-person at conferences and on-line to complete an anonymous, 46 item survey measuring: demographic factors, physician and practice characteristics; confidence in differentiating skin lesions; knowledge and use of dermoscopy; intentions to use; and barriers to use. We conducted bivariate analysis for each outcome and entered the significant predictors into two logistic regressions.

Results: Almost 20% had ever used a dermascope and 8.3% were currently using it. Ever having used a dermascope was associated with being 39 years of age or younger, practicing in academia or community centers, and having higher confidence differentiating skin lesions. Current use was associated with seeing more than 400 patients per month and being 60 years-of-age or older.

Conclusion: Use of dermoscopy by FPs is low. This study is an initial step in understanding its use among US FPs.

Introduction

As the initial point of contact with the health care system, family physicians (FPs) play a critical role in the early detection of preventable diseases such as skin cancers. FPs routinely screen for skin cancer through visual inspections, which may not be the most optimum strategy [1]. Use of

dermoscopy, a relatively inexpensive technology, improves diagnostic accuracy and reduces unnecessary biopsies and referrals to dermatologists [2]. Although studies suggest the dermascope maybe a valuable tool [2,3], little is known about its use among FPs. We examine FP's use of dermoscopy in the United States (US), factors associated with use, and barriers.

TABLE 1. Sample Characteristics

Characteristics	% of total sample	% that have ever used a dermascope	% currently using of those who have ever used
Age (N*=695)			
≤39 (n=177)	25.5	36.7 (n=65)	35.4 (n=23)
40–49 (n=171)	24.6	21.1 (n=36)	36.1 (n=13)
50–59 (n=181)	26.0	11.6 (n=21)	57.1 (n=12)
≥60 (n=166)	23.9	6.6 (n=11)	81.8 (n=9)
Ethnicity (N*=702)			
White (n=548)	78.1	19.0 (n=104)	42.3 (n=44)
Black (n=63)	9.0	22.2 (n=14)	42.9 (n=6)
Hispanic/Latino (n=33)	4.7	12.1 (n=4)	25.0 (n=1)
Asian/Pacific Islander (n=45)	6.4	22.2 (n=10)	50.0 (n=5)
Other (n=13)	1.9	23.1 (n=3)	66.7 (n=2)
Gender (N=705)			
Male (n=412)	58.4	17.5 (n=72)	48.6 (n=35)
Female (n=293)	41.6	21.8 (n=64)	35.9 (n=23)
Degree (N=705)			
D.O. (n=532)	75.5	19.4 (n=103)	43.7 (n=45)
M.D. (n=173)	24.5	19.1 (n=33)	39.4 (n=13)
Location (N*=702)			
Urban (n=201)	28.6	20.9 (n=42)	52.4 (n=22)
Suburban (n=306)	43.6	17.0 (n=52)	38.5 (n=20)
Rural (n=186)	26.5	26.3 (n=49)	30.6 (n=15)
Other (n=9)	1.3	33.3 (n=3)	33.3 (n=1)
Type of Medical Practice (N=705)			
Solo (n=190)	27.0	10.0 (n=19)	63.2 (n=12)
Group (n=272)	38.6	19.9 (n=54)	42.6 (n=23)
Hospital-based (n=72)	10.2	16.7 (n=12)	33.3 (n=4)
Academic medicine (n=68)	9.2	33.8 (n=23)	43.5 (n=10)
Community health center (n=72)	10.2	30.6 (n=22)	31.8 (n=7)
Other (n=31)	4.4	19.4 (n=6)	33.3 (n=2)
Time in direct patient care (N=705)			
≤25% (n=28)	4.0	17.9 (n=5)	20.0 (n=1)
26%–50% (n=31)	4.4	25.8 (n=8)	25.0 (n=2)
51%–75% (n=67)	9.5	29.9 (n=20)	40.0 (n=8)
≥76% (n=579)	82.1	17.8 (n=103)	45.6 (n=47)
Number of patients/month (N*=695)			
≤100 (n=115)	16.5	18.3 (n=21)	14.3 (n=3)
101–200 (n=116)	16.7	25.0 (n=29)	37.9 (n=11)
201–300 (n=149)	21.4	22.1 (n=33)	45.5 (n=15)
301–400 (n=161)	23.2	15.5 (n=25)	36.0 (n=9)
≥401 (n=154)	22.2	16.2 (n=25)	68.0 (n=17)
Number of patients/month with suspicious lesions that might be cancerous (N*=689)			
≤1.5 (n=84)	12.2	16.7 (n=14)	21.4 (n=3)
1.51–4.99 (n=135)	19.6	20.0 (n=27)	29.6 (n=8)
5–9.99 (n=132)	19.2	20.5 (n=27)	40.7 (n=11)
10–19.99 (n=159)	23.1	18.2 (n=29)	37.9 (n=11)
≥20 (n=179)	26.0	20.0 (n=35)	65.7 (n=23)

Characteristics	% of total sample	% that have ever used a dermoscope	% currently using of those who have ever used
Confidence differentiating benign and malignant skin lesions (N*=702)			
Not confident at all (n=15)	2.1	6.7 (n=1)	(n=0)
A little confident (n=132)	18.8	16.7 (n=22)	18.2 (n=4)
Neither confident nor unconfident (n=154)	21.9	13.6 (n=21)	33.3 (n=7)
Confident (n=335)	47.7	20.6 (n=69)	47.8 (n=33)
Very confident (n=66)	9.4	34.8 (n=23)	60.9 (n=14)
Heard of a dermoscope (N*=702)			
Yes (n=432)	61.5	31.5 (n=136)	42.6 (n=58)
Read about a dermoscope (N*=690)			
Yes (n=210)	30.4	41.0 (n=86)	52.3 (n=45)
Used a dermoscope (N*=698)			
Yes (n=136)	19.5	–	–
Currently use a dermoscope (N*=698)			
Yes (n=58)	8.3	–	–
Intentions to incorporate dermoscopy into clinical practice in 12 months (N*=618)			
Yes (n=393)	63.6	22.6 (n=89)	–

*N varies due to missing data

TABLE 2. Main Barriers to Incorporating Dermoscopy into Clinical Practice

	Mean	Standard Deviation
Cost of the equipment	3.9	1.2
Time and training requirements to become proficient in its use	3.6	1.2
Insufficient reimbursement	3.4	1.4

Methods

We recruited 705 practicing FPs in-person at conferences and online to complete an anonymous, 46-item survey measuring demographic factors; physician and practice characteristics; confidence in differentiating skin lesions; knowledge and use of dermoscopy; intentions to use in the next 12 months; and barriers to use (see Survey). We ran descriptive analyses and determined the bivariate associations between key factors and ever having used the dermoscope (Model 1) and currently using the dermoscope among those who had ever used it (Model 2). For each dependent variable, we ran a logistic regression on the significant factors ($p < 0.05$).

Results

Sample characteristics are described in Table 1. Ever having used a dermoscope (Model 1) was associated with being 39

years of age or younger (OR=8.9, CI=4.3–18.6), practicing in academic (OR=2.8, CI=1.3–5.8) or community centers (OR=2.6, CI=1.2–5.5), and having higher confidence differentiating skin lesions (OR=1.7, CI=1.4–2.2). Currently using the dermoscope (Model 2) was associated with seeing more than 400 patients per month (OR=8.0, CI=1.6–40.8) and being 60 years of age or older (OR=6.2, CI=1.1–34.6). Both models were highly significant and correctly classified 80.8% (Model 1) and 68.8% (Model 2) of participants. The main barriers were: cost of the equipment (M=3.9, SD=1.2); time and training requirements (M=3.6, SD=1.2); and insufficient reimbursement (M=3.4, SD=1.4) (Table 2).

Discussion

Despite the benefits of dermoscopy, only 19.5% of participants had ever used it and 8.3% were currently using it. It is not surprising that younger age was the strongest predictor in Model 1, given the increasing availability of dermoscopes in current training programs [4]. This could also explain the association with practicing in academia. Since they serve lower socioeconomic status communities, FPs practicing in community centers may be drawn to dermoscopy to reduce costs and improve outcomes. The relationship between greater confidence differentiating lesions and ever having used a dermoscope is perplexing. Are FPs with higher diagnostic confidence more likely to have used the dermoscope *per se*, or has experience using the dermoscope increased their confidence?

In Model 2, seeing an average of more than 400 patients per month was the strongest predictor of current dermascope use. It could be that FPs who see more patients recognize the need to find tools that increase diagnostic accuracy such as the dermascope. Interestingly, older age, rather than younger age, predicted current use. Since two of the top three barriers to using the dermascope involved financial issues, it could be that older FPs with well-established practices that generate higher revenues have overcome these financial barriers.

Although we recruited participants from 47 states, our sample may not be representative of the US population of FPs. Another limitation was the use of self-report; however, since we were not dealing with sensitive topics, the tendency to provide socially desirable responses was reduced. Last, because many participants completed the survey without direct oversight, there were skip pattern errors and missed responses.

Conclusion

Our study represents an initial step in understanding dermoscopy use among US FPs. Dermoscopy is an underutilized

tool that may help FPs promote the health and well being of their patients.

Acknowledgments: We thank the dean of NSU COM and the NSU research fellowship program for the opportunity to conduct this research. We also thank the professional organizations and conference officials who helped us with data collection. Most importantly, we thank all survey participants.

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— SURVEY —

Please read each question carefully and provide your answers by circling the number that reflects your answer or writing the response on the line provided. Please remember that this survey is completely anonymous and there are no right or wrong answers. Thank you once again for your participation in this study.

1. How old are you? _____
2. What is your gender?
 1. Male
 2. Female
3. Which of the following most closely describes your ethnic background?
 1. White, non-Hispanic origin
 2. Black, non-Hispanic origin
 3. Hispanic/Latino/Latina
 4. Asian/Pacific Islander
 5. Native American
 6. Other, please specify _____
4. In which state do you spend the majority of your time practicing medicine? _____
5. What type of medical degree do you have?
 1. D.O.
 2. M.D
6. What year did you graduate from medical school? _____
7. How would you best describe your primary specialty area?
 1. Family Practice
 2. Internal Medicine
 3. Obstetrics/Gynecology
 4. Pediatrics
 5. Adolescent Medicine
 6. Surgery
 7. Geriatrics
 8. Other, please specify _____
8. What percentage of your time is spent in direct patient care?
 1. 0 to 25%
 2. 26% to 50%
 3. 51% to 75%
 4. 76% to 100%
9. Which of the following best describes your type of medical practice?
 1. Solo practice
 2. Single specialty group practice
 3. Multispecialty group practice
 4. Hospital-based practice
 5. Academic medicine
 6. Community health center or community clinics
 7. Other, please specify _____

10. Which of the following best describes the location of your primary practice?
1. Urban
 2. Suburban
 3. Rural
 4. Other, please specify _____
11. In a typical month, approximately how many patients do you see? _____
12. In a typical month, approximately how many of the patients you see present with suspicious skin lesions that might be cancerous? _____
13. How confident are you in your ability to differentiate between cancerous and non-cancerous skin lesions?
1. Not confident at all
 2. A little confident
 3. Neither confident nor unconfident
 4. Confident
 5. Very confident
14. When a patient presents with a suspicious skin lesion, which of the following most closely describes what you typically do?
1. Conduct a naked eye examination of the lesion
 2. Examine lesion with the aid of a magnifying device
 3. Refer patient to a dermatologist
 4. Other, please specify _____
15. Physicians use different strategies to get up to date medical information. Which of the following are your 2 top sources for obtaining information on skin cancer screening and prevention?
1. Medical journals
 2. Internet sources other than medical journals
 3. Conferences
 4. Discussions with colleagues
 5. Media coverage
 6. Other, please specify _____
16. Have you ever heard of a dermascope, a device that helps physicians screen for skin cancers?
1. No (skip to Q17)
 2. Yes

If yes, in what context did you hear about it?

 1. A conversation with a colleague
 2. At a conference
 3. At a ground rounds
 4. At a class
 5. Other, please specify _____
17. Have you ever read about dermoscopy in the medical literature?
1. No (skip to Q18)
 2. Yes

If yes, how much have you read?

 1. 1 article
 2. 2 to 4 articles
 3. 5 or more articles
18. Have you ever used a dermascope?
1. No
 2. Yes

If yes, do you currently use it in your clinical practice?

1. No
2. Yes

Intention to use

The following questions address different properties of skin cancer screening tools that make them more or less acceptable to physicians. Using a scale from 1 to 5, where 1 is not at all likely and 5 is very likely, please tell us how likely you are to use a dermascope in your clinical practice if it.....

	Not at all likely				Very Likely
1. Was easy to use	1	2	3	4	5
2. Costs less than \$500	1	2	3	4	5
3. Could be attached to a smartphone	1	2	3	4	5
4. Was handheld	1	2	3	4	5
5. Training could be done in 1 day	1	2	3	4	5
6. Is more sensitive than a naked eye exam	1	2	3	4	5
7. Costs more than \$1500	1	2	3	4	5
8. Requires little maintenance	1	2	3	4	5
9. Requires a lot of practice	1	2	3	4	5
10. Does not record digital images	1	2	3	4	5
11. Reduces the need for biopsies	1	2	3	4	5
12. Can help identify suspect skin lesions quickly	1	2	3	4	5
13. Decreases cost of care	1	2	3	4	5
14. Increases your confidence in screening for skin cancer	1	2	3	4	5
15. Could increase revenue	1	2	3	4	5
16. Adds a few minutes to the patient encounter	1	2	3	4	5

The prevalence of skin cancer is increasing and primary care providers are well poised to assist in its early detection. Dermascopes are relatively inexpensive, easy to use, and there is strong evidence indicating that they are more effective at screening for skin cancer than naked eye examinations.

19. Using a scale from 1 to 5, where 1 is not at all likely and 5 is very likely, how likely are you to incorporate use of a dermascope as part of your clinical practice within the next 6 months? _____

20. Using a scale from 1 to 5, where 1 is not at all likely and 5 is very likely, how likely are you to incorporate use of a dermascope as part of your clinical practice within the next 12 months? _____

Barriers to use

There are a number of issues that may keep physicians from incorporating dermoscopy into their clinical practice. On a scale from 1 to 5, where 1 is no barrier and 5 is a very big barrier, please tell us the degree to which each of the following items represents a barrier to incorporating dermoscopy into your clinical practice.

	No Barrier					Very Big Barrier
1. Insufficient reimbursement	1	2	3	4	5	
2. Added time to the patient encounter	1	2	3	4	5	
3. Cost of the equipment	1	2	3	4	5	
4. Time and training requirements to become proficient in its use	1	2	3	4	5	
5. Skin cancer screening is a low priority for non-dermatologists	1	2	3	4	5	
6. Increased patient anxiety	1	2	3	4	5	
7. Increased risk of lawsuits	1	2	3	4	5	
8. Patients may not accept it	1	2	3	4	5	
9. Dermatologic concerns may be secondary to chief complaint if there are multiple comorbidities	1	2	3	4	5	
10. No available training	1	2	3	4	5	