

Assessment of postgraduate skin lesion education among Iowa family physicians

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Abstract

Background: Family medicine physicians play a pivotal role in the prevention and early detection of skin cancer. Our objective was to evaluate how family physicians believe their postgraduate training in skin cancer screening and prevention has prepared them for independent practice and to assess the need for enhanced skin lesion teaching in a family medicine residency setting.

Methods: A descriptive, cross-sectional survey investigating provider demographics, confidence in providing dermatological care, residency training, current medical practice, and skin cancer prevention beliefs was mailed to all family medicine physicians in the state of Iowa as listed in the Iowa Academy of Family Physicians annual directory in 2006 (N = 1069).

Results: A total of 575 family medicine physicians completed the survey for an overall response rate of 53.8%. Overall, family medicine physicians reported feeling confident in their ability to diagnose skin lesions (83.2%), differentiate between benign and malignant lesions (85.3%), and perform a biopsy of a lesion (94.3%). Only 65% of surveyed physicians felt that their residency program adequately trained them in diagnosing skin lesions and 65.7% of physicians agree that they could have benefited from additional training on skin lesions during residency training. Nearly 90% of clinicians surveyed believe that skin cancer screenings are the standard of care; however, only 51.8% perform skin cancer screening examinations during adult health maintenance visits more than 75% of the time. The primary reason listed by respondents who said they do not routinely perform skin cancer screenings was inadequate time (68.2%).

Conclusion: Family medicine physicians in the state of Iowa are confident in evaluating skin lesions. However, they reported a need for additional enhanced, targeted skin lesion education in family medicine residency training programs. Physicians believe that skin cancer screening examination is the standard of care, but find that inadequate time increasingly hinders skin cancer screening during routine health maintenance examinations.

Keywords

Skin neoplasms, graduate medical education, dermatology, family medicine, health screening

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Background

Skin cancer incidence has increased over the last 40 years, making it one of the most commonly diagnosed cancers and a major public health issue in the United States.¹ With the rise in skin cancer cases, resources must be utilized to improve both primary and secondary prevention of skin cancer. As family medicine physicians see a larger portion of the population than dermatologists, they can play an important role in prevention, diagnosing, and triaging skin cancer. Multiple barriers currently prohibit primary physicians from doing so. These barriers include inadequate physician training, insufficient time, limited reimbursement for preventive care, and overall lack of emphasis on skin care during routine health maintenance examinations.² Additionally, the US Preventive Services Tasks Force (USPSTF) released a recent

recommendation statement which concludes “the current evidence is insufficient to assess the balance of benefits and

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harms of visual scan cancer screening in adults.”³ Nationwide skin cancer screening was introduced in Germany in 2008. Despite promising results from a regional pilot study, the introduction of nationwide skin cancer screening has not yet led to a decline in mortality due to melanoma.⁴ Inconclusive recommendations and practice barriers likely decrease systematic skin cancer screening although it could lead to reduced morbidity and mortality.⁵

The adequacy of skin cancer training received by family medicine physician residents is a potential barrier deserving continued attention. Recent studies have suggested that some methods may be more effective in teaching dermatology to primary care physicians. Uncertainty persists regarding the adequacy of skin cancer training family medicine physicians receive.

A survey of family physicians in the state of Iowa was conducted to determine how well residency programs prepared family physicians for skin cancer screening and prevention. We also assessed if there was a need to increase or enhance current skin lesion curriculum in the family medicine residency setting.

The objectives of the study were to (1) evaluate how family physicians believe their postgraduate training in skin cancer screening and prevention has prepared them for independent practice and (2) assess need for enhanced skin lesion teaching during residency. We examined physicians' confidence in diagnosing and management, adequacy of residency training, perceived need for more skin lesion training, and practice behavior of performing skin cancer screening examinations.

Methods

Participants and setting

This study was coordinated at Northeast Iowa Family Practice Center in Waterloo, IA, a family physician clinic staffed by physicians and residents. Study participants were Iowa family medicine physicians recruited from the Iowa Academy of Family Physicians annual directory in 2006 (N=1069). A two-page survey was mailed in March 2006 to their addresses as listed in the directory. A second mailing was sent to non-responders in June 2006.

Study design

The study design was cross-sectional. A mail survey consisting of three sections was approved by the Covenant Joint Institutional Review Board. Section 1 consisted of five demographic questions. Section 2 asked respondents to utilize a 5-point Likert scale (strongly agree to strongly disagree) to indicate their level of agreement regarding their confidence in skin lesion management, the adequacy of their residency's dermatologic training, and beliefs related to skin screening. Section 3 consisted of seven questions addressing

specific clinical practices. Four of the seven questions asked the respondent to choose a categorical answer or yes/no and the other three questions were to be answered with one of the following percentage ranges: never (0%), 1%–25%, 26%–50%, 51%–75%, 76%–99%, or 100%.

Analysis

The results were tabulated and descriptive data were analyzed using SPSS 16.0 for Windows. Questions with no responses were not included in the final tabulation.

To determine how well residency programs prepared family physicians for skin cancer screening and prevention, it was important to measure their confidence in performing various skin screenings. Therefore, using specific questions that measured physicians' confidence level in performing different skin tests, we completed an exploratory factor analysis on section 2 survey questions and extracted one factor with the questions “I am confident in diagnosing skin lesions,” “I am confident in differentiating benign from malignant skin lesions,” “I am confident in excising or performing a biopsy of a skin lesion.” We dropped the question “I believe routine skin cancer screening is standard of care” because it did not load together with the main factor that was extracted from the analysis. The latter items that loaded appropriately into one factor were then averaged to obtain a “confidence” scale and it had an alpha reliability coefficient of 0.722.

Based on the aims of the study to examine physicians' confidence in diagnosing and management, adequacy of residency training, perceived need for more skin lesion training, and practice behavior of performing skin cancer screening examinations, four multiple ordinary least squares (OLS) were run. First, we ran a linear regression to predict the factors that influenced how confident the respondents are about diagnosing and excising skin lesions. The dependent variable was the confidence scale obtained from the factor analysis. The independent variables were the demographic information including years of practice, residency training, community size, age, and gender. These were dummy coded with 1–5 years as the reference group for years of practice, yes to completing residency in Iowa as the reference group for whether they completed their residency training in Iowa, practicing in rural area as the reference group for size of community they practiced in, 26–35 years as the reference group for age, and male as the reference group for gender.

Second, we predicted the factors that influenced how much the residency program trained them in diagnosing skin lesions. Similar predictor variables were used.

Third, a multiple linear regression predicted the factors that influenced if respondents would have benefited from more teaching of skin lesions in their residency training. The dependent variable was the question “I would have benefited from more teaching of skin lesions in their residency training” which was on a 5-point Likert scale with “strongly

Table 1. Characteristics of Iowa family medicine physician survey respondents.

Characteristic	All respondents N=575 (%)
Age, years	
26–35	95 (16.8)
36–45	178 (31.6)
46–55	195 (34.6)
56–65	89 (15.8)
>65	7 (1.2)
Sex, N (%)	
Male	376 (68.2)
Female	199 (31.8)
Years actively practiced medicine	
1–5 years	108 (19.0)
6–10 years	110 (19.4)
11–20 years	165 (29.1)
21–30 years	146 (25.7)
>30 years	38 (6.7)
Completed residency in Iowa, Yes	373 (66.6)
Size of practicing community	
Rural (<5000)	126 (22.3)
Non-metropolitan (5000–50,000)	229 (40.6)
Urban (>50,000)	209 (37.1)

Note: The listed percentage reflects the percent of responses for each survey item.

agree to strongly disagree” response options. The independent variables were the demographic information including years of practice, residency training, community size, age, and gender. These were dummy coded with 1–5 years as the reference group for years of practice, yes to completing residency in Iowa as the reference group for whether they completed their residency training in Iowa, practicing in rural area as the reference group for size of community they practiced in, 26–35 years as the reference group for age, and male as the reference group for gender.

Finally, we predicted the behavior, how often they completed a skin cancer screening examination during an adult health maintenance visit using the demographics and the questions “My residency program adequately trained me in diagnosing skin lesions” and “I would have benefited from more teaching of skin lesions in their residency training.” A multiple linear regression was run. The same dummy coded independent variables were included. A copy of the survey is available in supplementary material.

Results

Demographics

A total of 575 responses were received by 27 February 2007, for an overall response rate of 53.8%. Respondents were predominately male (68.2%), aged 36–55 years (66.2%), and had completed their residency training in Iowa (66.6%; Table 1).

Survey results

Respondents reported confidence in their management of skin lesions. They “strongly agree” or “agree” they can correctly diagnose (83.2%), differentiate (85.3%), and perform excision or biopsy of a lesion (94.3%; Table 2). Respondents felt less confident with their residency training as only 65.1% of respondents indicated that they were adequately trained in diagnosing skin lesions (“strongly agree” or “agree”; Table 2). Furthermore, 65.7% responded that they would have benefited from more teaching of skin lesion management during residency (Table 2). Since residency training, greater than 60% of the respondents had attended a continuing medical education (CME) course or lecture on a dermatologic topic within the last 5 years.

A majority of physicians surveyed felt routine skin cancer screening represents standard of care (89.6%, “strongly agree” or “agree”), yet 93% of physicians reported that there was no clinic screening protocol at their practice site (Table 2). Only 51.8% of physicians reported performing a skin cancer screening examination at more than 75% of their adult health maintenance visits (Table 3). Physicians who noted that they did not routinely perform skin cancer screen examinations indicated it was due to “inadequate time” (68.2%), “insufficient data to support” (16.2%), “inadequate training” (3.2%), or “other” reasons (12.3%) such as patient declined or works at a different practice setting.

Regression analysis

Confidence in diagnosing. The main objective of the study was to evaluate how family physicians believe their postgraduate training in skin cancer screening and prevention has prepared them for independent practice (measured by their confidence level in performing screenings and tests). Hence, the answers to the survey questions were averaged to obtain a “confidence” scale. Physicians with 21–30 years of active practice were significantly less likely to report confidence in diagnosing and excising skin lesions compared to those with 1–5 years of practice ($t=-2.437$, $p=0.015$; Table 4). Females compared to males were more likely to have confidence in diagnosing and excising lesions (Table 4).

Adequacy and amount of training. The second objective of the study was to assess need for enhanced skin lesion teaching during residency. We found that physicians with 21–30 years of practice were less likely to report the residency program adequately trained them in diagnosing skin lesions and that they would have benefited from more teaching during their residency compared to those with 1–5 years of actively practicing medicine ($t=-2.519$, $p=0.012$ and $t=2.929$, $p=0.004$, respectively; Table 4). Females were also more likely to report their residency program provided adequate training (Table 4).

Frequency of completing skin screening examinations. Related to the aims, we also examined physicians’ practice behavior in regard to performing skin cancer screening examinations.

Table 2. Physician responses on confidence, adequacy of residency training, and beliefs related to skin cancer screening (N = 575).

Survey question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
<i>Confidence in skin lesion management—No. (%)</i>					
Confident in diagnosing skin lesions?	115 (20.4)	354 (62.8)	85 (15.1)	10 (1.8)	0 (0.0)
Confident in differentiating benign from malignant skin lesions?	109 (19.3)	372 (66.0)	72 (12.8)	11 (2.0)	0 (0.0)
Confident in excising or performing a biopsy of a skin lesion?	349 (62.2)	180 (32.1)	20 (3.6)	10 (1.8)	2 (0.4)
<i>Adequacy of residency training—No. (%)</i>					
Adequately trained in diagnosing skin lesions?	84 (15.0)	281 (50.1)	140 (24.5)	50 (8.8)	6 (1.1)
Would have benefited from more teaching of skin lesions?	115 (20.5)	253 (45.2)	124 (22.1)	63 (11.3)	5 (0.9)
<i>Beliefs related to skin cancer screening—No. (%)</i>					
Routine skin cancer screening is standard of care	275 (48.6)	234 (41.3)	46 (8.1)	9 (1.6)	2 (0.4)
Reminder system/template would assist in detecting skin lesions	115 (20.5)	253 (45.2)	124 (22.1)	63 (11.3)	5 (0.9)

Note: The listed percentage reflects the percent of responses for each survey item.

Table 3. Survey respondent completion of skin cancer screening and skin lesion management (N = 575).

Survey question	0% ^a	1%–25%	26%–50%	51%–75%	76%–99%	100%
Frequency of completing a skin cancer screening examination during an adult health maintenance visit—No. (%)	12 (2.2)	50 (9.2)	75 (13.8)	125 (23.0)	210 (38.6)	72 (13.2)
Percent of excised skin lesions sent for pathological examination in 2005—No. (%)	7 (1.3)	24 (4.5)	38 (7.1)	102 (18.9)	239 (44.3)	129 (23.9)
Percent of excised skin lesions that were diagnosed as malignant in 2005—No. (%)	33 (6.4)	324 (62.5)	88 (17.0)	56 (10.8)	17 (3.3)	0 (0.0)

^aPercentages in column headings represent the frequency respondents reported for the corresponding activity or finding.

We found that many factors were significant in predicting the frequency of performing skin screenings. Compared to practicing in a rural area, practicing in a non-metropolitan area ($t=2.413$, $p=0.016$) and practicing in an urban area ($t=3.387$, $p=0.001$) were positively related to completing more skin cancer screening examinations (Table 4). Respondents with more than 30 years of actively practicing medicine were more likely to complete skin cancer screenings compared to those with 1–3 years of actively practicing medicine (Table 4). Being female compared to being male was associated with completing a skin cancer screening examination more frequently ($p<0.05$; Table 4). Finally, respondents who thought their residency program adequately trained them in diagnosing skin lesions were less likely to complete a skin cancer screening examination ($t=-5.537$, $p<0.001$) after controlling for other demographics (Table 4).

Discussion

Respondents from our survey reported a high level of confidence in their management of skin lesions. Our survey results suggest that family medicine physicians in Iowa have either received adequate training in targeted dermatology education

in residency training or have attained additional education through practice experience or CME. Most likely, the increased confidence in skin care found is secondary to practice experience and CME courses as nearly 60% of respondents have attended a CME course or lecture on a dermatologic topic in the last 5 years.

Our results from the regression analyses were unexpected. Physicians with 21–30 years of practice experience (26% of respondents) were significantly less likely to report confidence in diagnosing and excising lesions compared to those with 1–5 years of experience. Perhaps physicians with more experience had greater recognition of the difficulties in clinical decision making, including confidence in skin lesion management.

Some effect of gender was observed in the regression analyses as well. Female physicians were significantly more likely to report increased confidence, perform skin cancer screening examination, and report their residency adequately trained them in diagnosing skin lesions. We are uncertain of the reason for this observed difference. However, female physicians have been associated with improved control over patient's comorbidities and are more likely to have their practice influenced by formal guidelines.^{6–9}

Table 4. Regression analysis examining the factors associated with physician perception of residency training, and confidence and frequency of screenings.

Variables	Confidence in diagnosing or excising skin lesion	Residency provided adequate training	Benefited from more teaching in residency	Frequency of performing skin cancer screening
	Standardized coefficients (beta) ^a	Standardized coefficients (beta)	Standardized coefficients (beta)	Standardized coefficients (beta)
Practice years				
1–5 (reference)				
6–10	–0.098	–0.051	0.064	0.027
11–20	–0.109	–0.083	0.160	–0.006
21–30	–0.229*	–0.234*	0.278*	0.010
>30	–0.056	0.100	–0.001	0.159*
Completed residency in Iowa (reference)				
Did not complete residency in Iowa	0.062	0.017	0.048	–0.061
Practice area				
Rural (<5000; reference)				
Non-metropolitan (5000–50,000)	0.030	–0.006	–0.046	0.127*
Urban (>50,000)	0.043	0.014	–0.057	0.179†
Age in years				
26–35 (reference)				
36–45	–0.026	–0.058	0.014	0.120
46–55	0.025	0.046	–0.019	0.066
56–65	0.132	0.162	–0.043	0.041
>65	–0.024	0.025	–0.005	0.010
Gender				
Male (reference)				
Female	0.195†	0.100*	–0.018	0.120*
My residency program adequately trained me in diagnosing skin lesions				–0.273†
I would have benefited from more teaching of skin lesions in my residency training				0.027
R ² values	0.079	0.092	0.056	0.126

* $p < 0.05$, † $p < 0.001$.

^aBeta is the average amount the dependent variable increases when the independent variable increases by one standard deviation and other independent variables are held constant. The value of beta determines the importance of the variable in the regression.

Past studies suggest that many primary care physicians are not able to perform at a level equivalent to dermatologists when diagnosing and making evaluation plans for all forms of skin cancer.^{10–16} Literature reviews recognized a need for increased training by primary care physicians in the diagnosis of skin diseases.^{11,17} Marked differences exist in the abilities of dermatologists versus other physicians to correctly diagnose skin conditions and ultimately dermatologists' diagnostic skills were superior in comparison.^{11,17} It is postulated that this may be due to the fact that primary care physicians receive very little dermatologic education in this area.^{11,17} Our data suggest a need for increased targeted dermatological education in the residency setting as most physician respondents indicated they would have benefited from more teaching.

A similar survey study by Wise et al.¹⁸ looked at factors related to resident-reported skill level with skin cancer screenings. The medical residents were pooled from four programs and had a variety of specialties, including family

medicine.¹⁸ Their study found that residency training rarely included adequate skin cancer screening lessons, as less than 16% of residents reported being trained or skilled.¹⁸ These findings further support a need to increase dermatology teaching during residency.

Residency review requirements (RRC) for Family Medicine Residency Education have fluctuated over the years. From 1984 to 1998, the curricular requirements were an educational experience in dermatology with a duration in the range of 60–120 h. From 1999 to 2006, the requirement was changed to at least 60 h, most of which should be in an outpatient setting.¹⁹ Since 2007, the opposite occurred and guidelines have become more limited. The 2015 Accreditation Council for Graduate Medical Education (ACGME) RRC in Family Medicine states that all residents must have experience in diagnosing and managing common dermatological conditions.²⁰ Therefore, despite the need for increased dermatological education, Family Medicine training guidelines

have yet to reflect this. The lack of change may be related to USPSTF finding insufficient evidence to recommend whole-body skin examinations by primary care physicians.³ A recent meta-analysis evaluated the effectiveness of educational practices to improve the detection, categorization, and identification of skin lesions.²¹ Multicomponent educational interventions over longer time periods were associated with the greatest improvement in participant's abilities.

Several studies, including this survey, suggest that primary care physicians should receive more training in the diagnosis of skin disease.^{10,11,22} The survey results show that 60% of respondents have attended a CME course on dermatologic topics since the year 2000, demonstrating a possible need of Family Medicine graduates for additional dermatological training. Such CME courses and lectures could prove to be beneficial. Studies have shown that participation in additional dermatology trainings may improve providers' diagnostic and triage accuracy of skin cancer as well as increase their knowledge of skin cancer and confidence in their provision of skin cancer control activities.^{12,22-24}

Although training may not be adequate, a majority of our respondents rated skin cancer screening as important. Nearly 90% of physicians surveyed believe that skin cancer screenings should be a routine part of adult health maintenance visits; however, only about 50% said that they perform skin cancer screening examinations during such visits with more than 75% of their patients. In fact, the frequency of skin cancer examination among primary care physicians is significantly less than other cancer examinations (digital rectal examination, breast examination, and PAP smear).²⁵ Studies have shown that the proportion of primary care visits in which skin cancer screening and prevention occurs is low and strategies to increase skin cancer prevention and screening need implementation.²⁶ In the last decade, skin cancer screening rates have been consistently low.²⁷

We observed that physicians practicing in a rural area were significantly less likely to perform skin cancer screening examinations compared to those practicing in more urban locations. This may reflect the relative shortage of rural providers and their heavy patient workload. Furthermore, the primary reason listed by our respondents who report they do not routinely perform skin cancer screenings was inadequate time. Barriers to skin cancer screening such as inadequate physician training, insufficient time, limited reimbursement for preventive care, and overall lack of emphasis on skin care during routine health maintenance examinations have been demonstrated in other studies as well.² Insufficient time is an intriguing response as the skin cancer screening examination is relatively quick to perform and can be easily incorporated into various other parts of the health maintenance examination.

Limitations

Our survey has several limitations. While 53.8% of physicians voluntarily responded to the survey, selection bias may have been introduced relative to respondent motivation, clinical

interest, or other unknown factors. Physician self-report was utilized for all survey questions. Physicians, and other learners, may intrinsically overestimate their abilities or confidence.²⁸ No direct measures (e.g. continuing education or patient record review) were utilized to confirm responses.

There were also limitations stemming from the questions that were utilized in the analysis. For example, while we did ask physicians if they felt their residency program adequately trained them in diagnosing skin lesions, we did not ascertain which individual curricular aspects were of greatest value to them.

Conclusion

Family medicine physicians in the state of Iowa believe that routine skin cancer screening is the standard of care. Family medicine physicians are confident in their abilities with evaluating skin lesions, although they felt their residency training could have provided more adequate dermatological training. In all, 60% of family medicine physicians attended dermatologic continuing education. Although USPSTF guidelines determined that there is insufficient evidence for skin cancer screening in asymptomatic adults, these results suggest a need for an enhanced, targeted dermatological education in family medicine residency training programs.

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Declaration of conflicting interests

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Ethical approval

This study was approved by the Wheaton Joint Institutional Review Board. It qualified for "exempt review" due to the survey nature of the study.

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Informed consent

Informed consent was implied with the return of a completed survey from respondents.

Supplemental Material

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