Thick melanoma is associated with low melanoma knowledge and low perceived health competence, but not delays in care

To the Editor: Understanding patient factors associated with thick melanoma may help target interventions to improve early detection. We interviewed patients with newly diagnosed melanoma to determine whether tumor thickness is associated with delays in seeking medical attention, health care utilization patterns, tumor characteristics, or health self-efficacy.

Structured interviews of patients aged 18 or older with a first diagnosis of invasive primary cutaneous melanoma in the prior 12 months were conducted. Patients were identified by using a convenience sample of patients presenting to dermatology and oncology clinics in an urban tertiary care center between July 2016 and August 2018.

Of 128 patients interviewed, 49 (38%) had thin melanomas (<1 mm), 59 (46%) had intermediate-thickness melanomas (1-4 mm), and 20 (16%) had thick melanomas (>4 mm). Patients with thick melanoma were older ($\tilde{x} = 67$ years) than those with intermediate-thickness ($\tilde{x} = 59$) or thin ($\tilde{x} = 56$ years) melanoma (Table I). Symptomatic lesions and vertical growth were associated with thicker tumors.

Health care utilization patterns in the year before diagnosis did not differ by group, but fewer patients with thick melanomas performed skin self-examination or had a physician skin examination (Table II). Compared with patients with thinner melanomas, patients with thick melanomas reported shorter delays before biopsy, had lower perceived health competency scores,[1] and reported lower melanoma knowledge but did not differ in terms of health information avoidance[2] or multidimensional health locus of control scores.[3]

Little is known about the association of melanoma thickness with health self-efficacy.[1-3] We found no significant differences between melanoma thickness and health information avoidance, which measures the tendency to avoid or delay available but potentially unwanted health information,[2] and multidimensional health locus of control, which measures one's beliefs about the degree to which health is within one's own control rather than determined by external factors or chance[3] and has previously been associated with lower adherence to annual skin cancer screening in high-risk patients[4] and lower rates of follow-up of suspicious findings on mammography.[5] Greater melanoma thickness was correlated with lower self-reported melanoma knowledge and lower perceived health competency, which measures the degree to which an individual feels competent to manage health outcomes.[1] Together with our finding that thick melanoma was not associated with delays in seeking attention for a concerning lesion, this suggests that a knowledge and confidence gap rather than conscious neglect is associated with thicker melanoma.

Increased accuracy of data collection thanks to in-person interviews and increased recall accuracy by limiting our patient population to those recently diagnosed with melanomas are strengths of this study; a limitation is the use of self-reported data from a single institution. Our findings suggest that presentation with thick melanoma may be due to a lower degree of knowledge about and confidence in one's ability to identify melanoma, as well as to a rapid tumor growth rate, rather than to intentional patient avoidance. Public health efforts to improve melanoma awareness may empower patients to correctly identify and seek attention for melanoma at more curable stages. Additionally, consistent with prior studies,[4] no thick melanomas were found by health care providers during screening, suggesting that routine screening may reduce melanoma mortality.

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Table I. Patient demographic and tumor-specific characteristics by Breslow depth

	Variable	Thin (<1 mm)	Intermediate thickness (1-4 mm)	Thick (>4 mm)	All Breslow thicknesses	*P* value
Patient demographics	Eligible participants who completed the interview	49 (38.0%)	59 (46.0%)	20 (16.0%)	128 (100%)	
	Median age, y (IQR) (N = 128)	**56 (45-66)**	**59 (45-66)**	**67 (55-79)**	**59 (46-69)**	**.008**
	Male, n (%) (N = 128)	18 (36.7%)	26 (44.1%)	11 (55.0%)	55 (43.0%)	.370
	Household income <$50,000, n (%) (N = 120)	13 (26.5%)	20 (37.7%)	10 (55.6%)	43 (35.8%)	.083
	Married or cohabits with partner, n (%) (N = 127)	39 (79.6%)	41 (70.7%)	15 (75.0%)	95 (74.8%)	.572
Tumor-specific characteristics	Less visible anatomic location, n (%) (N = 128)	16 (32.7%)	31 (52.5%)	10 (50.0%)	57 (44.5%)	.102
	Symptomatic (bleeding, itching, pain), n (%) (N = 124)	**2 (4.4%)**	**21 (36.2%)**	**9 (45.0%)**	**32 (25.8%)**	**<.001**
	Ugly duckling sign, n (%) (N = 124)	33 (71.7%)	44 (75.9%)	20 (100%)	89 (71.8%)	.397
	Vertical growth, n (%) (N = 124)	**6 (13.0%)**	**24 (41.4%)**	**11 (55.0%)**	**41 (33.1%)**	**.001**
	Median estimated tumor diameter when first noticed (IQR) (N = 115)	5 mm (3-7)	5 mm (4-10)	6 mm (4-10)	5 mm (4-10)	.615
	Median estimated tumor diameter when biopsy was performed (IQR) (N = 110)	6 mm (4-10)	7 mm (5-10)	10 mm (4-15)	7 mm (5-12)	.272
	Median % growth in estimated tumor diameter when noticed and subjected to biopsy (IQR) (N = 107)	0% (0-50)	0% (0-100)	20% (0-150)	0% (0-67)	.299
	Atypical color (did not contain brown or black), n (%) (N = 114)	8 (21.1%)	16 (28.6%)	8 (40.0%)	32 (28.1%)	.310
	Asymmetric, n (%) (N = 121)	20 (46.5%)	28 (48.3%)	4 (20.0%)	52 (43.0%)	.086
	Irregular borders, n (%) (N = 121)	18 (41.9%)	26 (44.8%)	5 (25.0%)	49 (40.5%)	.571

Boldface indicates statistical significance.
IQR, Interquartile range.

Table II. Health care utilization patterns and health self-efficacy by Breslow depth

	Variable	Thin (<1 mm)	Intermediate thickness (1-4 mm)	Thick (>4 mm)	All Breslow thicknesses	*P* value
Health care utilization patterns	Flu shot, n (%) (N = 127)	33 (67.4%)	36 (62.1%)	14 (70.0%)	83 (65.4%)	.758
	Routine physical examination in past 12 mo, n (%) (N = 127)	37 (75.5%)	49 (84.5%)	17 (85.0%)	103 (81.1%)	.462
	Performed SSE in past 12 mo, n (%) (N = 126)	**30 (62.5%)**	**24 (41.4%)**	**6 (30.0%)**	**60 (47.6%)**	**.022**
	Had PSE in past 12 mo, n (%) (N = 127)	**33 (67.4%)**	**18 (31.0%)**	**6 (30.0%)**	**57 (44.9%)**	**<.001**
	Melanoma detected or diagnosed during screening by HCP, n (%) (N = 127)	**18 (36.7%)**	**6 (10.3%)**	**0 (0.00%)**	**24 (18.9%)**	**.001**
	Told by HCP not to worry about melanomas, n (%) (N = 127)	9 (18.4%)	14 (24.1%)	6 (30.0%)	29 (22.8%)	.551
	Median days of delay from initially noticing lesion until biopsy, n (IQR) (N = 119)	97 (14-548)	97 (41-205)	55 (35-136)	90 (30-210)	.618
Melanoma knowledge and health self-efficacy	**Never heard of or slightly knowledgeable of melanoma, n (%) (N = 127)**	**24 (49.0%)**	**33 (56.9%)**	**17 (85.0%)**	**74 (58.3%)**	**.007**
	Did not think that initial skin lesion was skin cancer, n (%) (N = 127)	25 (51.0%)	36 (62.1%)	15 (75.0%)	76 (59.8%)	.164
	Median HIA Scale[2] score (IQR) (N = 128)	14 (9-19)	13 (9-20)	16 (11-20.5)	14 (9-20)	.522
	Median PHC Scale[1] score (IQR) (N = 128)	**34 (29-37)**	**33 (28-36)**	**31 (26.5-32.5)**	**33 (28.5-35.5)**	**.037**
	Median MHLC Scale[3] score (internally scored) (IQR) (N = 128)	16 (15-18)	15 (12-18)	17.5 (14-22.5)	16 (13-18.5)	.135
	Median MHLC Scale[3] score (externally scored) (IQR) (N = 128)	18 (15-22)	20 (16-24)	19 (16-25.5)	19 (15-24)	.381

Boldface indicates statistical significance.

HCP, Health care provider; *HIA*, health information avoidance; *IQR*, interquartile range; *MHLC*, multidimensional health related locus of control; *PHC*, perceived health competence; *PSE*, physician skin examination; *SSE*, skin self-examination.

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Evaluation of a virtual basic dermatology curriculum for dermoscopy by using the triage amalgamated dermoscopic algorithm for novice dermoscopists

To the Editor: Dermoscopy involves the use of a single handheld tool that incorporates illumination and magnification for improved visualization of skin structures. However, dermoscopy requires a knowledge base to be properly interpreted. In studies with new dermoscopists, dermoscopy was shown to provide no benefit to standard physical examinations,[1] and might actually decrease sensitivity.[2] In fact, one of the largest barriers to dermoscopy usage reported by dermatologists in the United States is the lack of training, which has resulted in only 48% of US dermatologists using dermoscopy.[3]

The triage amalgamated dermoscopic algorithm (TADA)[4,5] differs from standard methods of dermoscopy education in that it starts by teaching the dermoscopic features of common benign lesions, so they can be excluded in further evaluation.[6] The algorithm then teaches the identification of malignant skin lesions through abnormalities of the pigment network and vascular structure (Figs 1 and 2). This simplified algorithm has high sensitivity and specificity for both benign and malignant neoplasms and inherently caters to new dermoscopists.[4]

Approval was obtained from the institutional review boards of Pennsylvania State University (CR9551) and the US Air Force 59 Medical Wing (FWH20180132H). Voluntary, fully informed consent of the participants used in this research was obtained as required by 32 CFR 219 and DODI 3216.02_AFI40-402. We administered a 1-hour live seminar to the 59 physicians in Pennsylvania and a recorded e-learning version of the same training to the 43 physicians in Florida who consented to the study. Both groups had limited previous exposure to dermoscopy and completed a test of 30 benign and malignant dermoscopy images before training and a separate test after training.

All participants had significant improvement ($P < .001$) in sensitivity for detecting malignant skin lesions with good specificity (Table I). The live lecture yielded an increase in sensitivity from 62% to 88%, and the e-learning method yielded an increase from 70% to 92%. Although the participants in the e-learning method had a higher baseline score than the live lecture ($P \leq .01$), the resultant final sensitivities after education were not significantly different ($P = .13$; noninferiority t test with 10% margin, $P < .01$). We conclude that the e-learning method is at least noninferior to a live lecture setting for teaching dermoscopy and has many inherent benefits. E-learning enables training of larger audiences using the internet on individual monitors with perhaps better color and detail than a projector at a pace that is individualized to the learner. Indeed, e-learning was the preferred method of the participants in this arm of the study.

Dermatoscopes have been described as stethoscopes for the skin because of their utility in cutaneous diagnosis. However, a dermatoscope, like a stethoscope, is only 1 tool used in the full physical