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Social and demographic factors associated with differences in skin self-examination practices for skin cancer detection

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To the Editor:

Although the US Preventive Services Task Force (USPSTF) cites a lack of evidence to support skin self-examination (SSE) as an effective secondary skin cancer prevention practice [1], studies have shown an association between skin self-examination and a reduced incidence of melanoma [2,3]. This suggests that SSE may be important for those with elevated skin cancer risk, such as melanoma survivors [4,5]. Little is known about how skin self-examination practices vary among different populations. In this study, we investigated social and demographic characteristics associated with increased likelihood of performing SSE for skin cancer detection.

We examined the Health Information National Trends Survey (HINTS) 5 Cycle 1, a cross-sectional survey of US adults by the National Cancer Institute, from January to May 2017 [6]. Survey respondents were identified via random sampling of residential addresses. Skin self-examination performance was determined by answering "yes" to the question, "Do you ever check your skin for signs of skin cancer?" Additional covariates included age, sex, geographic region, education, race/ethnicity, smoking status, and past-year indoor tanning use. Documentation provided by HINTS informed weighting of survey responses to account for selection variability [6]. We performed univariate and multivariable logistic regression on the weighted sample and calculated odds ratios to investigate associations between covariates and SSE performance. Statistical analyses were performed using SAS 9.4 (SAS Institute, Cary, North Carolina).

The unweighted and weighted samples included 2,349 and 176,011,834 participants, respectively. Unadjusted analysis revealed that increasing age, female sex, non-Hispanic White race, married marital status, college or postgraduate education, former or never smoker status, past-year indoor tanning use, and prior healthcare provider skin examination were associated with a greater prevalence of performing SSE (**Table 1**). Adjusted odds ratios (aOR) of performing SSEs were significantly higher in non-Hispanic Whites (aOR 3.36, 95% CI 2.44-4.62, **Table 2**) compared to other races/ethnicities. Females (aOR 1.97, 95% CI 1.39, 2.80) were more likely to perform SSE than males. Former smokers (aOR 1.97, 95% CI 1.17-3.38) and never smokers (aOR 1.94, 95% CI 1.20-3.10) were more likely to perform SSE than current smokers. Individuals in the West (aOR 1.96, 95% CI 1.03-3.70) and South (aOR 1.72, 95% CI 1.08-2.72) and those who have received a healthcare provider skin examination (aOR 9.88, 95% CI 6.61-14.77) were also more likely to conduct SSEs. Past-year indoor tanners were not more likely to perform SSE (aOR 2.05, 95% CI 0.69-6.11) than those who do not tan indoors.

Table 1. *Social and demographic characteristics of respondents by skin self-examination status: Health Information National Trends Survey 5 Cycle 1.*

Characteristics	Performs skin self-examination % (SE)	Does not perform skin self-examination % (SE)	P value
Total			
N (Unweighted)	1,532	817	
N (Weighted)	108,814,763	67,197,071	
Age, years (mean, SD)	57.4 (0.4)	51.8 (0.5)	<0.01
Sex			
Male	41.8 (1.6)	53.1 (2.4)	<0.01
Female	58.2 (1.6)	46.9 (2.4)	
Region			
Northeast	19.1 (1.5)	18.1 (2.0)	0.81
Midwest	21.1 (1.3)	22.4 (2.2)	
South	36.0 (1.6)	36.0 (2.5)	
West	23.8 (1.6)	23.5 (2.4)	
Race/ethnicity			
Non-Hispanic White	81.3 (1.1)	49.3 (2.5)	<0.01
Other[a]	18.7 (1.1)	50.7 (2.5)	
Marital Status[b]			
Married	63.3 (1.9)	51.0 (3.0)	<0.01
Not married	36.6 (1.9)	49.0 (3.0)	
Education			
No higher education	59.0 (1.2)	68.3 (2.0)	<0.01
College	25.1 (1.3)	19.2 (1.8)	
Postgraduate	15.9 (0.9)	12.5 (1.5)	
Smoking status			
Current Smoker	10.8 (1.1)	18.1 (2.4)	<0.01
Former Smoker	28.0 (1.6)	21.3 (2.4)	
Never Smoker	61.2 (1.8)	60.6 (3.0)	
History of indoor tanning			
No	94.8 (1.1)	98.1 (0.8)	0.02
Yes	5.2 (1.1)	1.9 (0.8)	
HCP[c] Skin Exam			
No	35.8 (2.2)	86.1 (2.6)	<0.01
Yes	64.2 (2.2)	13.9 (2.6)	

SE, standard error; SD, standard deviation; HCP, health care provider.

[a]Other race/ethnicity includes Black or African American, Hispanic, American Indian or Alaska Native American Indian, Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, Other Asian, Native Hawaiian, Guamanian or Chamorro, Samoan, or Other Pacific Islander.

[b]Married includes married and living as married; not married includes divorced, widowed, separated, single/never married.

We found that SSE practices vary among different subpopulations. Despite a total higher incidence of melanoma in men [7], males were less likely to perform SSE. Indoor tanners were not more likely to perform SSE despite an increased risk of melanoma [8]. Individuals from racial and ethnic minorities (including Blacks/African Americans, Hispanics, Asians and Pacific Islanders, and American Indians and Alaska Natives) were less likely to perform SSE. Although skin cancer is less common in these populations, they are at increased risk of late-stage melanoma diagnoses and worse prognoses [9]. Individuals in the West and South were more likely to perform SSE, possibly related to higher ultraviolet (UV) radiation in these states contributing to higher prevalence of melanomas [10], or greater public awareness in these states. Former and never smokers were more likely than current smokers to perform

SSE, possibly reflecting differences in health literacy in these populations [11]. The strongest association with SSE was provider skin exam, but causality is unclear; this association may relate to selection bias or provider skin examinations offering education promoting SSE. We are unable to verify how well SSE was performed by respondents, or frequency of SSE. Additional studies are needed to understand why SSE practices differ between certain subpopulations and to enrich participation among those at highest risk of skin cancer.

Potential conflicts of interest

The authors declare no conflicts of interest.

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Table 2. *Multivariate adjusted odds ratio (aOR)* of performing skin self-examination: Health Information National Trends Survey 5 Cycle 1.*

Variable	aOR	95% CI
Age	1.00	0.99, 1.01
Sex		
Male	1.00	Ref
Female	**1.97**	**1.39, 2.80**
Race/ethnicity		
Other[a]	1.00	Ref
Non-Hispanic White	**3.36***	**2.44, 4.62**
Marital Status[b]		
Not married	1.00	Ref
Married	1.29	0.87, 1.92
Region		
Midwest	1.00	Ref
West	**1.96***	**1.03, 3.70**
Northeast	1.61	0.87, 2.96
South	**1.72***	**1.08, 2.72**
Education		
No higher education	1.00	Ref
Postgraduate	1.20	0.84, 1.70
College	1.43	0.97, 2.10
Smoking status		
Current	1.00	Ref
Former	**1.97***	**1.17, 3.38**
Never	**1.94***	**1.20, 3.10**
History of HCP[c] skin exam		
No	1.00	Ref
Yes	**9.88***	**6.61, 14.77**
History of indoor tanning		
No	1.00	Ref
Yes	2.05	0.69, 6.11

Bold values indicate statistically significant results, defined as P<0.05.

aOR, adjusted odds ratio; CI, confidence interval; Ref, reference; HCP, health care provider.

**Adjusted for age, sex, race/ethnicity, marital status, region, education, smoking status, history of HCP skin exam, and history of indoor tanning.*

[a]Other race/ethnicity includes Black or African American, Hispanic, American Indian or Alaska Native American Indian, Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, Other Asian, Native Hawaiian, Guamanian or Chamorro, Samoan or Other Pacific Islander.