Table I. Participant responses to animal-based sutures by dietary preferences

Questions		Nonvegetarian, no. (%)	Vegetarian, no. (%)	*P* value*
Would you want to know whether animal products are being placed in your skin?	Yes	67 (74.4)	6 (85.7)	.68
	No	23 (25.6)	1 (14.3)	
Would it affect your decision of which stitches to use knowing it is an animal-based product?	Yes	32 (37.6)	4 (57.1)	.43
	No	53 (62.4)	3 (42.9)	
Would you decline the use of animal-based material used in stitches?	Yes	26 (30.6)	4 (57.1)	.21
	No	59 (69.4)	3 (42.9)	
If you answered yes to "Would you want to know whether animal products are being placed in your skin?" would you decline even if it meant you would have to come back for another visit to remove the stitches?	Yes	27 (45.8)	3 (60.0)	.66
	No	32 (54.2)	2 (40.0)	

*Fisher's exact test was used because cell counts were less than 5.

Our study is limited by its single-center nature, but our results indicate a substantial proportion of dermatologic patients want to be informed about animal product in their sutures, regardless of dietary preferences. Therefore, it can be argued that patients should be informed if animal product is going to be used and given the option of an alternative suture type. This issue has only recently been explored in medical and surgical fields,[1-3] including dermatology.[4] With an increasingly diverse patient population, it is imperative for dermatologists to be considerate of each patient's perspective and to recognize the potential effect of personal beliefs on treatment choices. Patients may also prefer to be informed about the nonbiodegradable nature of plastic sutures (ie, polypropylene) and the associated environmental effect.[5] Informing patients of the nature of sutures during informed consent may promote more socially, culturally, and environmentally appropriate medical care and strengthen the patient-physician relationship.

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Public misperceptions of common sunscreen labeling claims: A survey study from the Minnesota State Fair

To the Editor: Despite deliberate education efforts by the American Academy of Dermatology (AAD) and previous regulations set forth by the United States Food and Drug Administration (FDA) to standardize sunscreen labeling practices,[1] preliminary studies have demonstrated basic sunscreen labeling to be poorly understood by the general public.[2,3] In addition, a multitude of supplementary features are marketed by sunscreen companies, many of which are not FDA regulated and may create further confusion in sunscreen purchasing.[4]

This study aimed to build on previous research identifying gaps in sunscreen knowledge to clarify potential misperceptions regarding sunscreen labeling claims. Furthermore, given the FDA's proposed rule to further clarify sunscreen labeling as part of the 2019 Sunscreen Innovation Act,[5] this project sought to help effect this change.

Table I. Knowledge pertaining to common sunscreen labeling claims

Variable	No. correct (%)
Sunscreen labeling claims	
Sensitive skin (avoids use of common irritants)	373/492 (75.8)
Water resistant (protects while swimming or sweating)	361/492 (73.4)
Extended protection (maintains protection >2 hours)	324/494 (65.6)
Noncomedogenic (avoids use of common irritants)	300/489 (61.3)
Sport (protects while swimming or sweating)	297/492 (60.4)
Broad spectrum (UVA, UVB)*	147/493 (29.8)
Sun protection factor (UVB)†	58/493 (11.8)
Natural/organic (none of the above)‡	46/491 (9.4)
Baby/safe for children (none of the above)§	41/492 (8.3)
American Academy of Dermatology recommendations	
Minimum SPF (SPF 30)	300/493 (60.9)
Time interval for reapplication (2 hours)	292/493 (59.2)
Average number of ounces required for an adult in a swimsuit (1 ounce)	187/493 (37.9)
True or false	
"Tanning" or "instant bronzing" sunscreens allow the wearer to safely obtain a tan while being protected from the sun (False)	417/492 (84.8)
SPF 60 sunscreen offers twice as much protection as SPF 30 sunscreen (False)‖	388/491 (79.0)
It is recommended to use insect repellent in combination with sunscreen rather than two separate products (False)	340/492 (69.1)
"Dermatologist recommended" or "clinically proven" sunscreens are endorsed by the American Academy of Dermatology (False)	265/492 (53.9)
FDA testing is required to prove that a sunscreen is "hypoallergenic" (False)	234/493 (47.5)
FDA testing is required to prove that sunscreen labeled "instant protection" works immediately after application (True)	204/491 (41.5)

FDA, Food and Drug Administration; *No.*, number; *SPF*, sun protection factor; *UVA*, ultraviolet A; *UVB*, ultraviolet B; *UVC*, ultraviolet C.
*Considered correct if both UVA and UVB were selected (UVC was also an option).
†Considered correct if UVB was selected (UVA and UVC were also options).
‡Multiple choice options included: (A) Product is chemical-free; (B) Main sun-protecting chemical is plant-derived; (C) Product is biodegradable and environmentally friendly; and (D) None of the above.
§Multiple choice options included: (A) Provides higher SPF levels and increased sun protection; (B) Formula is tear-free and organic; (C) Contains gentle ingredients proven not to harm a baby's skin; and (D) None of the above.
‖When considered as UVB light filtered.

Minnesota State Fair 2019 attendees aged ≥18 years were invited to complete a 31-question, cross-sectional survey testing their "Sunscreen IQ." Demographics and information potentially affecting sunscreen knowledge were collected, including personal or family history of skin cancer, frequency of dermatology visits, prior sunscreen counseling, employment involving sunscreen knowledge, and parental status. Multiple linear regression models were used to assess the relationship between sunscreen knowledge predictors and the Sunscreen IQ.

A total of 496 fairgoers completed the survey. Participants were most often aged ≥40 years (72.0%), female (64.9%), white (89.3%), had a bachelor's degree (33.1%) or higher (32.9%), and were of Fitzpatrick skin type II (42.3%) or III (35.1%). There were 57 participants (11.5%) who reported a personal history of skin cancer, most commonly basal cell carcinoma (50.0%). More than half endorsed at least 1 previous dermatology visit (54.2%) and having received prior sunscreen counseling by a health care provider (51.9%).

Participants' responses to sunscreen labeling claims are summarized in Table I. A minority of participants (11.8%) correctly selected that the sun protection factor value specifies ultraviolet B protection only; 29.8% correctly identified that the broad-spectrum designation indicates both ultraviolet A and B protection. Few participants correctly identified that sunscreens labeled as "baby/safe for children" (8.3%) and "natural/organic" (9.4%) typically have no actual standard criteria for such labeling claims. Approximately half (46.1%) assumed "dermatologist recommended" or "clinically proven" sunscreens were endorsed by the AAD. Similarly, 52.5% thought FDA testing was required to prove that sunscreens are "hypoallergenic."

Table II. Associations between sunscreen knowledge predictors and total "Sunscreen IQ"

			Adjusted models*	
Variable	**No.**	**Mean (SD)**	**β (SE)**	***P* value**
Sex				.0748
Female	322	9.4 (2.5)	0.41 (0.23)	
Male	174	9.0 (2.6)	Reference	
Age, y				.045
<40	139	9.5 (2.5)	0.49 (0.24)	
≥40	357	9.1 (2.5)	Reference	
Race				.0014
Nonwhite	53	8.2 (2.6)	−1.17 (0.36)	
White	443	9.3 (2.5)	Reference	
Education				<.0001
<Bachelor†	163	8.5 (2.2)	−1.14 (0.23)	
Bachelor or higher	327	9.6 (2.5)	Reference	
Skin type				.005
Types I-II	253	9.6 (2.5)	0.61 (0.22)	
Types III-VI	243	8.9 (2.5)	Reference	
Personal history of skin cancer				.3474
No	439	9.3 (2.5)	0.33 (0.35)	
Yes	57	8.7 (2.9)	Reference	
Family history of skin cancer				.1859
Not sure	28	9.5 (2.0)	−0.12 (0.49)	
No	320	9.0 (2.5)	−0.43 (0.24)	
Yes	147	9.6 (2.5)	Reference	
Dermatology visits				.0146
Never	227	8.9 (2.3)	−0.54 (0.22)	
Yes	269	9.5 (2.6)	Reference	
Prior sunscreen counseling				.0048
No	238	8.9 (2.3)	−0.63 (0.22)	
Yes	257	9.5 (2.6)	Reference	
Prior sunscreen training				.4098
No	418	9.2 (2.5)	−0.24 (0.30)	
Yes	77	9.4 (2.5)	Reference	
Parental status				.6637
No	180	9.4 (2.5)	0.12 (0.27)	
Yes	315	9.1 (2.5)	Reference	

No., Number; *SE*, standard error; *SD*, standard deviation.
*From multiple linear regression models adjusted for sex, age category, education, and skin type (unless the variable of interest).
†Bachelor's degree is a 4-year college degree.

Logistic regression identified the following factors as associated with improved sunscreen knowledge: white race, a bachelor's degree or higher, Fitzpatrick skin type I or II, previous dermatology visits, and prior sunscreen counseling (Table II). Limitations include possible selection bias, nonvalidated survey, and inherent variability in labeling claims.

The broad-spectrum and sun protection factor designations were poorly understood in our study population, confirming previous findings and reinforcing the need to clarify these terms via the FDA's Sunscreen Innovation Act.[5] FDA unregulated claims, such as "baby/safe for children," "natural/organic," "dermatologist recommended/clinically proven," and "hypoallergenic," were particularly misleading, raising the question about whether these claims should be formally regulated or removed from sunscreen packaging. Encouragingly, prior sunscreen counseling by any health care provider and even a single previous dermatology visit were associated with improved sunscreen knowledge. These findings highlight clinicians' impact on sunscreen understanding and support continued sun safety education efforts.

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