The Influence of Ethnicity, Gender, and Fitzpatrick Skin Type on High School Students' Ultraviolet Light Risk Awareness and Behavior

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Ultraviolet light (UVL) exposure is believed to play a major role in a wide array of skin diseases that have an enormous functional, psychological, and cosmetic impact. A cross-sectional survey of 303 high school students from an ethnically diverse school district was used to evaluate the roles of ethnicity, gender, and Fitzpatrick skin type (FST) on UVL risk awareness and behavior. Although ethnicity and FST were significantly associated ($P<.0001$), and Caucasian students with FSTs I and II were more likely to experience sunburn during the summer than students from other ethnic groups ($P<.0001$), FST was not predictive of sunburn recall by Hispanic students ($P=.12$). Female students had less weekend sun exposure than males ($P=.020$) and used more sunscreen ($P=.004$), but paradoxically reported more sunburns ($P=.018$). Ethnicity, gender, and FST are all important variables for understanding and addressing UVL risk awareness and behavior in high school students.

Ethnicity and gender play important roles in disease. The skin is of special interest in this regard because of the interacting roles melanin plays in biologic protection from ultraviolet light (UVL) and its impact on ethnic identity. In this research, high school students from a diverse school district were surveyed to determine the roles of ethnicity, gender, and Fitzpatrick skin type (FST) on their UVL risk awareness and behavior.

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METHODS

Following institutional review board approval, anonymous surveys were distributed to students enrolled in health classes during the fall of 2003 from 4 ethnically diverse Amarillo, Tex, high schools within the Amarillo Independent School District. Written parental consent was required of all student participants.

Associations among explanatory factors (FST, ethnicity, and gender) and associations between gender and outcomes (responses to survey questions) were assessed using the Pearson chi-square test. Associations between FST or ethnicity and outcomes were analyzed using stratified analysis controlling ethnicity or FST

because these 2 factors were highly correlated and could be confounded. The Cochran-Mantel-Haenszel test (or the extended Mantel-Haenszel statistic) was used for the stratified analysis.[1] All tests were examined at the .05 level of significance. PROC FREQ in the SAS® system, version 8.02, was used for statistical computations.[2]

RESULTS

A total of 303 students returned the survey along with the required parental consent for participation. Student demographics are summarized in the Table. Ethnicity and FST were significantly associated ($P<.0001$), with Caucasian students more likely distributed in FSTs I through IV, Hispanics and "other" ethnic minority groups distributed toward FSTs III through VI, and African American students highly distributed in FSTs V and VI.

Fitzpatrick Skin Type

FSTs I and II, when adjusted for ethnicity, were significantly associated with increased numbers of sunburns during the summer ($P<.0001$). However, Hispanic students with FSTs I and II were no more likely to recall sunburn than Hispanic students with FSTs III through VI ($P=.12$). When adjusted for ethnicity, students with FSTs III and IV were more likely to tan outdoors ($P=.005$) than students with other FSTs.

Ethnicity

Caucasian students were significantly more likely to be aware of the harmful effects of sun exposure than other ethnic groups ($P<.0001$) and were more likely to use sunscreen at outdoor pools ($P=.004$). Students who identified their ethnicity as Caucasian or "other" were more likely to use a tanning bed ($P=.006$) and were more likely to tan outdoors ($P<.0001$). After adjusting for FST, parents who identified their ethnicity as Caucasian or "other" used tanning beds or tanned outdoors more than Hispanic or African American parents ($P<.0001$). More Caucasian parents advised their children to use sunscreen ($P=.002$) than parents of other ethnic groups, when adjusted for FST.

Gender

Female students were more aware of harmful effects of sunlight than males ($P=.017$) but reported more sunburns ($P=.018$). Female students were also more likely to use sunscreen than males ($P=.004$) and to use a sunscreen with a sun protection factor (SPF) of greater than 15 ($P=.001$). Tanning bed use ($P=.0003$) and outdoor tanning ($P<.0001$) were more likely female behaviors. Males spent significantly more time outdoors during the weekends than females ($P=.020$).

Ultraviolet Light Survey Participant Demographics

	Number (N=303)*	Percentage
Gender		
Female	171	57
Male	128	42
No response	4	1
Grade		
9	186	62
10	68	22
11	25	8
12	23	8
Fitzpatrick Skin Type		
I-II	49	16
III-IV	171	57
V-VI	80	27
Ethnicity		
Caucasian	110	36
Hispanic	98	33
African American	36	12
Other†	58	19

*Numbers for grade, Fitzpatrick skin type, and ethnicity add up to less than 303 because some subjects did not answer all survey questions.

†Indicates 9 Asian, 10 Native American, and 39 persons who indicated "other" ethnicity.

COMMENT

The study of skin disease in Hispanics can provide insights about the roles played by ethnicity and biology because this ethnic group represents all FSTs. Ethnicity has become recognized as a more useful tool to understand the impact of culture and behavior on health issues compared with the widely recognized scientific limitations of "race" constructs.[3] In previous studies, Hispanic students in middle school through high school were found to use less sunscreen than non-Hispanic whites,[4,5] owing, perhaps, to a decreased perception of risk for sunburn, melanoma, and nonmelanoma skin cancer.[6,7] Although the incidence of cutaneous melanoma in California Hispanics is less per 100,000 population than for non-Hispanic whites (17.2 vs 2.8 for men, 11.3 vs 3.0 for women), the risk of metastasis prior to diagnosis was greater in Hispanics (15% vs 6% for men, 7% vs 4% for women),[8] possibly an indication of decreased risk awareness.

In this study, high school students with FSTs I and II recalled significantly more sunburns during the preceding summer compared with students with other FSTs, but this pattern was not present in the Hispanic students with FSTs I and II. This observation could be explained by different ethnic perceptions about sunburn. Independent of the biology of FST, if Caucasian students have a lower threshold than Hispanic students for recognizing and recalling sunburn, incongruous results may be reported for the same degree of UVL injury. Gender-related perceptual differences could also account for the counterintuitive observation that, although male students were less aware of UVL skin damage, spent more time outdoors during summer weekends, used less sunscreen, and used sunscreens with lower SPFs than females, the female students were more likely to report sunburn. Thus, ethnic and gender perceptual differences may explain the large variability in self-reports of sunburn.[9] However, it is also possible that males wear more protective clothing and hats when outdoors, a factor that could decrease their sunburn risk. An Australian study of secondary school students found that while female students used sunscreen and remained in the shade, males wore protective clothing.[10]

Additional research about the roles ethnicity and gender play in self-reporting skin disease is needed to devise more effective educational and behavioral interventions. The availability of such information may help Hispanic and other ethnic groups to better prevent skin damage from UVL. This is especially true for children and adolescents if educational efforts to change UVL attitudes and behaviors are to be optimized. Decreasing acute and cumulative lifetime exposure to UVL has the potential benefit of lowering lifetime risk for nonmelanoma skin cancer, melanoma, and other unwanted UVL-associated skin changes, such as dyschromia and premature aging, as well as other UVL-related skin disorders. The validity of the FST construct for various ethnic groups also deserves further study. In previous research, the relationship between self-reported FST and minimal erythema dose in a Korean student population was considered weak at best.[11]

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