

RESEARCH LETTERS

Adolescent Sun Protection Behaviors and Beliefs

Roya S. Nazarian, BA,¹ Michael Pan, MD,¹ Sarah Utz, MD,² Lauren Geller, MD¹

¹Department of Dermatology, Icahn School of Medicine at Mount Sinai, New York, NY

²Department of Dermatology, Wayne State School of Medicine, Detroit, MI

ABSTRACT

Importance: The incidence of melanoma and non-melanoma skin cancer has increased among children and adolescents. Studies in the pediatric population have shown low rates of sun protection with modest improvement over the past several decades.

Objective: This descriptive study characterizes photo protection behaviors and knowledge, specifically among pediatric dermatology patients in order to identify gaps in knowledge and guide discussion for health providers.

Methods: Adolescents ages 12 to 20 completed surveys, which evaluated use of sun protection, beliefs about tanning and skin cancer, and sources of information.

Results: Results demonstrated that only nine percent of participants reported daily, year-round use of sunscreen. The majority (71%) reported use only during the summer months or when spending prolonged periods of time outdoors. Rates of indoor tanning were lower than reported in the literature, with only one percent reporting indoor tanning use. The majority of patients reported family members were the primary source of sun protection education.

Conclusions and Relevance: The authors conclude that while adolescents receiving care in the pediatric dermatology setting demonstrate sufficient knowledge about skin cancer prevention, adherence remains low. This study identified family members as the primary source of sun protection knowledge. Dermatologists should consider increased parental education to improve adolescent patient behavior.

INTRODUCTION

Skin cancer is the most common malignancy in the United States, with a rising incidence, including in children and adolescents at a rate of 2% per year.¹ Exposure to ultraviolet (UV) radiation, either from natural sunlight or

indoor tanning, is a known risk factor for the development of skin cancer. Research has found that only 30% of adolescents report regular use of sunscreen and that 70-80% of them had sunburns the previous summer.² Previous studies on photo protection have utilized data from nationwide surveys of high school students; it is unclear whether these

November 2019 Volume 3 Issue 6

trends accurately reflect the beliefs of adolescents who seek dermatologic care, who may be hypothesized to practice better sun protection. Our study aims to characterize the behaviors and beliefs specifically of adolescents frequenting a pediatric dermatology clinic in order to better guide educational efforts by physicians.

METHODS

105 subjects age 12-20 were recruited from an outpatient pediatric dermatology practice at the Icahn School of Medicine at Mount Sinai in New York, where the study received Institutional Review Board approval. Participants completed a 26-question survey, which solicited information about demographics, knowledge of proper photo protection behavior, and implementation of sun protective practices, including use of sunscreen, frequency of application, use of indoor tanning, and use of sun protective clothing.

RESULTS

The mean age of the participants was 14.46 years, with 61% identifying as female and 65% as Caucasian. Twenty-eight participants (27%) reported a family history of skin cancer. Of those, 50% reported a family history of melanoma, and 40% reported basal cell carcinoma. Eighty-seven participants (87%) self-reported a lifetime history of at least one sunburn, and 54 participants (51%) reported a history of sunburn one or more times in the past year alone (Table 1).

Most participants did report some use of sunscreen, however, only 9% wore sunscreen daily and year-round, with the majority (71%) only doing so during the summer months or when spending prolonged

periods of time outdoors. Of those who reported any use of sunscreen, half reapplied sunscreen multiple times throughout the day. Use of other photo protection measures was low, with 39% reporting use of sunglasses and 25% reporting use of hats. Eighteen percent wore sun protective clothing. Only one adolescent in our study (1%) reported use of indoor tanning, however, they had done so 17 times (Table 2).

Analysis of sun protection attitudes and beliefs revealed that the majority had accurate knowledge about sunscreen, tanning, and skin cancer (Table 2). Many participants reported that family members, especially parents, had discussed sun protection (90%) and skin cancer (57%) with them. Much fewer reported that teachers had done so (32% and 37%).

Table 1. Basic Demographics of the Study Population (N=105)

<i>Characteristic</i>	N	%
Age in years (N=105)		
12-15	72	69
16-20	33	27
Sex (N=104)		
Male	41	39
Female	63	61
Race (N=105)		
Caucasian	70	67
African American	9	9
Latino	14	13
Asian	5	5
Other	7	7
Skin's reaction to sun (N=105)		
Always burns, never tans	10	10
Usually burns, sometimes tans	23	22

Sometimes burns, tans evenly everywhere	15	14
Burns occasionally, always tans	24	23
Very rarely burns, always tans	30	29
Never burns, never tans	3	3
Hair Color (N=105)		
Brown/black	83	79
Blonde	21	20
Red	1	1
Eye Color (N=104)		
Brown	59	57
Blue	19	18
Green	9	9
Hazel	17	16
Family History of Skin Cancer (N=104)		
Yes	28	27
No	66	63
Unsure	10	10

Table 2. Sun Protective Behavior and Knowledge		
<i>Behavioral Characteristic</i>	N	%
Frequency of sunscreen Use (N=105)		
Daily year-round	9	9
Daily during summer months only	9	9
Only when outdoors for prolonged time	58	55
Only when at the beach	13	12
Rarely	12	11
Never	4	4

Frequency of reapplication of sunscreen (N=105)		
Once a day	47	45
Multiple times a day	47	45
I don't wear sunscreen	11	10
Strength of SPF (n=90)		
SPF lower than 15	1	1
SPF 15 to 25	11	10
SPF 30 to 45	32	30
SPF 50+	46	44
Use of hat when outdoors (N=105)		
Always	4	4
Usually	22	21
Rarely	53	50
Never	26	25
Use of sunglasses when outdoors (N=105)		
Yes, always	13	12
Usually	28	27
Rarely	37	35
Never	27	26
Use of sun protective clothing (N=104)		
Yes	19	18
No	85	82
Lifetime history of sunburn (N=105)		
Yes, once	28	26
Yes, more than once	59	55
No	18	19
History of sunburn in last year (N=105)		
Yes, once	34	32

Yes, more than once	20	19
No	51	49
History of Indoor Tanning (N=105)		
Never	104	99
Once	0	0
2-5 times	0	0
5-10 times	0	0
> 10 times	1	1
Knowledge and Attitudes	N	%
I feel healthier with a tan (N=99)		
Agree	13	13
Disagree	86	87
I feel more attractive when I am tan (N=98)		
Agree	39	40
Disagree	59	60
I can stay out in the sun as long as I want if I wear sunscreen (N=103)		
Agree	21	20
Disagree	82	80
Sunscreen is waterproof (N=100)		
Agree	27	27
Disagree	73	73
Getting a “base tan” from indoor tanning can prevent sunburn later in the summer (N=97)		
Agree	5	5
Disagree	92	95
If you have darker skin you cannot get skin cancer (n=100)		
Agree	6	6
Disagree	94	94

<i>Sources of Sun Protective Knowledge</i>	N	%
Have your teachers in school talked to you about sun protection (N=104)		
Yes	33	32
No	71	68
Have your teachers in school talked to you about skin cancer (N=104)		
Yes	38	37
No	66	63
Has anyone in your family talked to you about sun protection (N=104)		
Yes	93	90
No	11	10
Has anyone in your family talked to you about skin cancer (N=104)		
Yes	59	57
No	45	43

DISCUSSION

Results demonstrate that photo protection amongst pediatric dermatology patients remains low, and rates of sunburns are high. Overall prevalence of daily sunscreen use throughout the year was low (9%), similar to data from national surveys on adolescent health, which found that 7-14% of high school adolescents regularly apply sunscreen.³ This rate is much lower when compared to adults in the general US population, in which 14.3% of men and 29.9% of women report daily sunscreen use.⁴ More specifically, proper use of photoprotection, such as sunscreen, remains a challenge. Healthcare providers should encourage reapplication of sunscreen and year-round use, which is the current recommendation by the American Academy of Dermatology.⁵ Additionally, our study

found that adolescents are infrequent users of sun-protective clothing, with many citing unfamiliarity with this concept in the free text response. This highlights a specific area for improved patient education.

The prevalence of indoor tanning has decreased nationwide studies in the past decade, and our results suggest that adolescents frequenting a pediatric dermatology clinic are less likely to use indoor tanning, as only 1% of participants reported use of indoor tanning, compared to 7% of U.S. high school in the general population.⁶ This suggests indoor tanning should not be the focus of in-office discussions by health providers.⁶ However, our data may be biased, given that the study population was recruited from an urban center in the Northeast, where tanning bed

usage has historically been less popular compared to Southern and rural areas. With regards to skin cancer prevention knowledge, the vast majority of study participants had accurate information about proper photo protection and skin cancer prevention, despite poor practices. This suggests that positive perceptions of tanned skin may have the greatest influence on adolescent sun behavior, even in a population frequenting a pediatric dermatology clinic.⁷ In fact 40% of participants reported they feel more attractive with a tan, which corroborates the current literature that self-image may impair safe practice, despite adequate knowledge (table II). This implies that healthcare providers should address whether tanned skin is valued by their patient as a standard of beauty prior to forming a preventative educational plan.

Finally, this study identified parents rather than teachers as the primary source of skin cancer education in adolescents. Interestingly, sunscreen usage has been shown to decrease as adolescents get older, possibly a result of less parental supervision.⁸ We believe earlier educational efforts are needed. However, one study found that only 49% of parents reported ever discussing skin cancer prevention with their pediatrician and that sun protection ranked lowest among preventative topics discussed by pediatricians.⁹ We hope these findings will guide the educational efforts of dermatologists and pediatricians alike to prioritize sun protection when educating parents.

Limitations of this study include the use of a non-validated survey. Additionally, there may be selection bias as subjects were largely Caucasian and from an urban center. It should be noted that while the majority of participants were Caucasian, almost 25% self-identified as African American or Latino.

CONCLUSION

Studies have shown that African American subgroups may be less aware of preventative skin care and practice fewer sun protective behaviors, and these differing practices may have skewed the photoprotection behavior results for the overall cohort.¹⁰

Our study suggests that adolescent patients who seek dermatologic care are poor practitioners of photo protection, consistent with the general adolescent population. While many report some use of sunscreen, proper application and reapplication is lacking and the use of sun protective clothing is poor. Furthermore, many still maintain the belief that they are more attractive with a tan, highlighting self-image as an important target in sun safety education. Healthcare providers should continue to educate patients and their parents to modify these behaviors.

Conflict of Interest Disclosures: None

Funding: None

Corresponding Author:

Lauren Geller, MD
5 E 98th Street, 5th Floor
New York NY 10029
Tel: (212) 241-9728
Fax: (212) 987-1197
Email: lgeller.md@gmail.com

References:

1. Wong JR, Harris JK, Rodriguez-Galindo C, Johnson KJ. Incidence of childhood and adolescent melanoma in the United States: 1973-2009. *Pediatrics*. 2013;131(5):846-854.
2. Cokkinides V, Weinstock M, Glanz K, Albano J, Ward E, Thun M. Trends in sunburns, sun protection practices, and attitudes toward sun exposure protection and tanning among US adolescents, 1998-2004. *Pediatrics*. 2006;118(3):853-864.

3. Jones SE, Saraiya M. Sunscreen use among US high school students, 1999-2003. *The Journal of school health*. 2006;76(4):150-153.
4. Buller DB, Cokkinides V, Hall HI, et al. Prevalence of sunburn, sun protection, and indoor tanning behaviors among Americans: review from national surveys and case studies of 3 states. *Journal of the American Academy of Dermatology*. 2011;65(5 Suppl 1):S114-123.
5. <https://www.aad.org/media/stats/prevention-and-care/vitamin-d-and-uv-exposure>.
6. Guy GP, Jr., Berkowitz Z, Everett Jones S, Watson M, Richardson LC. Prevalence of Indoor Tanning and Association With Sunburn Among Youth in the United States. *JAMA dermatology*. 2017;153(5):387-390.
7. Wright C, Reeder AI, Gray A, Cox B. Child sun protection: sun-related attitudes mediate the association between children's knowledge and behaviours. *Journal of paediatrics and child health*. 2008;44(12):692-698.
8. Dusza SW, Halpern AC, Satagopan JM, et al. Prospective study of sunburn and sun behavior patterns during adolescence. *Pediatrics*. 2012;129(2):309-317.
9. McRee AL, Mays D, Kornides ML, Gilkey MB. Counseling About Skin Cancer Prevention Among Adolescents: What Do Parents Receive From Health Care Providers? *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*. 2017;61(4):533-536.
10. Kelly S, Miller LE, Ahn HY, Haley JE. Perceptions and Portrayals of Skin Cancer among Cultural Subgroups. *ISRN dermatology*. 2014;2014:325281.