

Personal Sun Protection and Counseling Patterns among Primary Care Providers

Daniel Alexander Nadelman (✉ dnadelma@med.umich.edu)

University of Michigan Hospital <https://orcid.org/0000-0002-7953-6240>

Joel J. Heidelbaugh

University of Michigan Medical School

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Abstract

Background: Personal sun protection and patient counseling patterns among primary care providers is an important topic that has not previously been studied in great detail. Our report evaluates the relationship between sun protection habits among providers, patterns in discussions with patients about sun protection, and prior education on this topic during medical training. **Methods:** An online survey was sent to family medicine faculty and house officers. Four survey questions about personal sun protection and patient counseling habits were provided. Participants were then asked whether they had received formal education concerning sun protection during their medical training. **Results:** Our results suggest that providers who received formal education on sun protection during their medical training were more likely to personally use adequate protection and counsel their patients on this topic. **Conclusions:** This study highlights the importance of sun protection education among primary care providers. Our findings suggest that improving education on this topic among physicians may lead to increased awareness among both patients and providers. Productive discussions about sun protection in the primary care setting has the potential to improve sun protective habits among patients, which can in turn decrease the incidence of skin cancer.

Background

Skin cancer is the most common cancer in the United States. It has been estimated that one in five Americans will develop the disease at some point during their lifetime.¹ Skin cancer incidence in the United States has increased significantly over the past several decades.^{2,3} Melanoma, the deadliest form of skin cancer, has increased particularly rapidly; between 1982 and 2011, the incidence of melanoma in the US doubled from 11.3 to 23.7 cases per 100,000 people.^{4,5} Recent studies have estimated that in the year 2019 alone, 192,310 cases of melanoma will be diagnosed, with twenty individuals dying of the disease on average each day.² Total lifetime sun exposure and tanning bed use, particularly during childhood and adolescence, is directly associated with increased risk of skin cancer.⁴ In the United States, tanning bed use is widespread among Caucasians, particularly women ages 18-30. In this age group, up to 30% admit to using tanning beds at least once per year; half of these women (15%) use indoor tanning ten or more times per year.⁶ Tanning bed avoidance is extremely important in reducing the risk of skin cancer, as more than 400,000 cases of skin cancer per year in the United States can be attributed to tanning bed use alone.⁷ Consistent protection against natural ultraviolet radiation from the sun has also been shown to directly decrease incidence of skin cancer; one study evaluating daily sunscreen use revealed that patients who used sunscreen had half the melanoma risk compared with those who did not.⁸

Counseling patients regarding sun protection and tanning bed avoidance in order to prevent skin cancer is an important responsibility of healthcare providers. This is especially relevant for primary care physicians, as patients visit these providers on a regular basis and often develop close therapeutic relationships.⁷ The United State Preventative Services Task Force (USPSTF) currently recommends

counseling all parents of children ages 6 months through 24 years about the importance of sun protection (Level B recommendation).¹⁰ Such counseling has been shown to lead to an increase in sun protective behaviors, which in turn lower the future risk of skin cancer. Despite this recommendation, one report noted that only 34% of pediatricians counseled patients on sun protection during well-child exams in the summer months.¹¹ The USPSTF also recommends that providers counsel adults older than 24 years with fair skin about using sun protection; however, the evidence is not as strong as in younger individuals (Level C recommendation).¹⁰ While it is still relevant to counsel older patients about sun protection, the correlation between sun exposure in adults and skin cancer development is weaker than that involving sun exposure during childhood. However, the potential drawbacks of counseling adult patients on sun protection are minimal, and counseling is therefore appropriate in many cases.⁸

Despite the likely benefit of regularly counseling patients about sun protection, rates of discussions about sunscreen use at outpatient visits are surprisingly low. In the National Ambulatory Medical Care Survey (NAMCS) of a database of all outpatient clinic visits from 1989 to 2010 (18.30 billion visits), sunscreen use was only mentioned 0.07% of the time.¹² Sunscreen use is not relevant to all outpatient office visits, which may account for this staggeringly low statistic; however, this is still concerning given the direct benefit of sun protection in preventing skin cancer. Another NAMCS survey of 7.9 million high-risk patients (i.e. those with a prior history of skin cancer) revealed that dermatologists only counseled patients about sun protection 41% of the time, while family physicians did so 24% of the time.¹³ Likewise, another report from this past year also highlighted the fact that a majority of a group of 294 patients who regularly visited dermatologists did not receive adequate sun protection counseling, and as a result were unclear about current recommendations when queried.¹⁴

To date, few studies have investigated sun protection awareness and personal sun protection patterns among healthcare providers. One study reported that physicians who perceive this topic as important and use adequate personal sun protection tend to counsel significantly more patients in their practice.¹⁵ This study suggested that improving education among providers about sun protection in general will in turn lead to increased awareness among both patients and providers. However, few reports have investigated education patterns among physician-trainees regarding sun protection. One study revealed that less than 40% of primary care pediatricians received formal education regarding sun protection counseling during their medical training.¹⁶ Another report surveying French medical students also revealed a general lack of education and understanding about the importance of sun protection.¹⁷

Inadequate education of medical trainees regarding sun protection appears to be common. It is therefore important that healthcare providers receive formal education on this topic, as this could improve patient education and counseling by physicians. Productive discussions about sun protection between patients and providers has the potential to improve sun protective habits among patients, which can in turn decrease the incidence of skin cancer. In our report, we discuss a survey study conducted among family medicine faculty and residents aiming to ascertain the frequency of personal sun protection use and patient counseling among providers.

Methods

In accordance with the University of Michigan Medical School Institutional Review Board, an online survey was sent to family medicine faculty and house officers. Of the 170 recipients, 63 completed the survey (37% response rate). Four survey questions were asked followed by 5-6 answer choices. Participants were then asked whether they had received formal education regarding sun protection during their medical training. The survey questions were presented as follows:

1. Approximately how often do you use sunscreen when spending time outdoors (>15 minutes in the sun)?
 - a. Never
 - b. Rarely (less than 10% of the time)
 - c. Sometimes (less than half the time)
 - d. Often (more than half the time)
 - e. Almost Always (more than 75% of the time)
 - f. Always

2. Approximately what percentage of patients do you counsel on sunscreen use?
 - a. 0%
 - b. 10%
 - c. 25%
 - d. 50%
 - e. 75%
 - f. 100%

3. Approximately what percentage of patients do you counsel against tanning bed use?
 - a. 0%
 - b. 10%
 - c. 25%
 - d. 50%
 - e. 75%
 - f. 100%

4. How many times have you personally used a tanning bed in your lifetime?
 - a. Never
 - b. 1-2 times
 - c. ~5 times
 - d. ~10 times
 - e. >10 times

5. Did you receive formal education regarding counseling patients for sun protection and avoiding tanning bed use during your medical training?

- a. Yes
- b. No

Results

Of the 63 respondents to this survey, thirty-six (57%) received formal education regarding sun protection during their medical training. Twenty-seven (43%) received no formal education regarding this topic.

Fifty-two percent of total respondents counseled more than half of their patients on sunscreen use. While fifty-six of providers with formal sun protection education counseled more than half of their patients on sunscreen use, forty-eight percent of those without formal education on this topic counseled more than half of their patients.

Fifty-seven percent of respondents claimed to personally use sunscreen at least half the time when outdoors. Sixty-four percent of providers with formal education regarding sun protection personally used sunscreen more than half the time, whereas forty-eight percent of those without specific education responded that they personally use sunscreen more than half the time.

Forty-four percent of respondents counseled more than half of their patients on avoiding tanning bed use. Forty-seven percent of providers with sun protection education counseled more than half of patients on tanning bed avoidance, compared with forty-one of those providers without formal sun protection education. Of note, sixty-seven percent of respondents had never used a tanning bed while thirty-three percent had at least once in their lifetime; there was no difference in tanning bed use among those who received sun protection education versus those who did not.

Fifty-eight percent of providers who personally used sunscreen more than half the time counseled more than half of their patients on sunscreen use, compared with forty-one percent who did not personally use sunscreen. Forty-eight percent of providers who never used a tanning bed counseled more than half their patients on tanning bed avoidance, compared with thirty-three percent who had used tanning beds in the past.

Discussion

Personal sun protection and patient counseling patterns among primary care providers is a topic that has not been studied in detail. This subject is important since primary care physicians can potentially have a significant impact on patient compliance by counseling on modes of disease prevention. Our study investigated the relationship between personal sun protection habits, frequency of discussions about sun protection with patients, and prior education on this topic during medical training. Fifty-seven percent of those queried in our report received formal sun protection education; this is much more frequent than the percent reported by other sources in the literature.¹⁶⁻¹⁸ In addition, more than half of the respondents in our study counseled patients on sunscreen use, which is also more frequent than in other reports.¹³

Although the sample size of our study was small and the findings were not statistically significant, our results suggest that providers who were given formal education on sun protection during their medical training were more likely to personally use sunscreen and counsel their own patients about sunscreen use and tanning bed avoidance. This is an interesting finding because it highlights the importance of teaching this topic to residents and medical students, as it seems to lead to a change in both their personal and clinical practice. Personal sunscreen use was significantly higher in those providers who received education about sun protection (64% vs 48% of individuals), and those who wore sunscreen more than half the time in turn regularly counseled a greater percentage of their patients (58% vs 41%).

This supports previous findings in a study suggesting that physicians with better personal sun protection habits are more likely to counsel patients on this topic.¹⁵ In this earlier study, authors reported survey responses from 170 primary care physicians (internal medicine, family medicine, and pediatricians), while our study evaluated 63 family medicine faculty and residents. Providers were asked about personal sun protection habits and were then asked about their perceived importance of counseling patients on this topic. Those physicians who personally used adequate sun protection were more likely to perceive sun protection as an important preventative medicine issue and were more likely to approach this topic in discussions with patients. In contrast to our study, attending physician and resident responses were stratified, revealing statistically significant differences in both personal sun protection and counseling habits. Unlike our study, however, this report did not investigate the link between prior medical education and sun protection behavior and counseling among providers.¹⁵

Like the study described previously revealing a general lack of knowledge about sun protection among French medical students,¹⁷ another study evaluating the same subject among American medical students also revealed a suboptimal understanding regarding this topic.¹⁸ The authors of this report suggest that workshops and formal education should exist in order to help generate a better understanding of the importance of both personal sun protection and counseling patients about the risks of excess ultraviolet radiation. A report investigating a change in the Boston University School of Medicine Preventative Medicine curriculum for medical students revealed that increasing the hours of formal education regarding skin cancer prevention and counseling during the course of their training led to a significant improvement in counseling skills.¹⁹ This report highlighted the importance of preventative health education among medical trainees; such education can lead to a direct improvement in patient care. To the best of our knowledge, no similar reports have evaluated the topic of sun protection counseling education among primary care residents. It is likely that increasing the amount and quality of training on this topic will also lead to better outcomes in counseling patients.

It is interesting to note that while counseling pediatric and adult patients regarding sun protection are Level B and Level C USPSTF recommendations respectively, the USPSTF concluded that there is currently insufficient evidence to recommend counseling adults on regular skin examinations (Level I).¹⁰ Questions about skin exams for detecting cancer may arise while discussing sun protection with patients, and providers should be prepared to discuss the risks and benefits of routine examinations. Future

educational initiatives aiming to better train physicians to counsel patients about sun protection should therefore include a discussion about the insufficient evidence surrounding routine skin exams. Medical student and resident education should therefore focus on encouraging productive conversations about skin cancer prevention (i.e. sunscreen use and tanning bed avoidance) rather than early detection of skin cancer by self-examinations. This may change as more information regarding skin cancer screening recommendations becomes available.

Conclusions

Our study included only a small number of subjects, and statistical analysis was therefore not useful. Only 37% of those queried responded to the survey, which may have affected our results. It is possible that those who were more likely to respond to the survey were in general more likely to be aware of the importance of this topic. We did not stratify respondents based on house officer versus attending status, which may have led to different results as in the study described above.¹⁵ In addition, our survey only asked whether respondents did or did not receive education regarding this topic during medical training; we did not elaborate further on the amount or mode of education. Our survey was carried out at a large university hospital with an academic residency program, and our subjects may therefore not be representative of other family physicians.

Nonetheless, our results do reveal noteworthy findings underscoring the importance of sun protection education among healthcare providers. Further studies should be done to support these findings and provide additional information. In addition, given the increased utility of sun protection counseling in the pediatric population as evidenced by the USPSTF recommendations, a similar study among pediatricians would be useful. Investigations evaluating the most effective mode of education (e.g. during medical school vs residency, online vs in-person workshops, etc.) regarding sun protection would also be useful. This report highlights the importance of sun protection education among primary care providers, and we hope that it has laid the foundation for future work investigating this topic.

Abbreviations

United States Preventive Services Task Force (USPSTF); National Ambulatory Medical Care Survey (NAMCS)

Declarations

Ethics approval and consent to participate: Official approval by the University of Michigan Medical School Institutional Review Board (IRB) was obtained. Study participants were aware of the anonymity of survey results and that we planned to publish our findings; consent to participate was implied by completion of the survey. The ethics department of the University of Michigan Institutional Review Board approved this survey prior to sending it to participants and confirmed that no additional consent was required.

Consent for publication: The University of Michigan Medical School Institutional Review Board (IRB) gave consent for the authors to publish these findings.

Availability of data and material: Our survey data is available for analysis if necessary.

Competing interests: The authors have no conflicts of interest or competing interests to disclose.

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References

1. Stern RS. Prevalence of a history of skin cancer in 2007: results of an incidence-based model. *Arch Dermatol.* 2010 Mar;146(3):279-82.
2. American Cancer Society. *Cancer Facts & Figures 2019*. Atlanta: American Cancer Society; 2019.
3. Siegel RL, Miller KD, Jemal A. *Cancer statistics, 2019*. *CA Cancer J Clin.* 2019; doi: 10.3322/caac.21551.
4. Guy GP, Thomas CC, Thompson T, Watson M, Massetti GM, Richardson LC. Vital signs: Melanoma incidence and mortality trends and projections—United States, 1982–2030. *MMWR Morb Mortal Wkly Rep.* 2015;64(21):591-596.
5. Cancer Stat Facts: Melanoma of the Skin. <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/skin-cancer-counseling2>.
6. National Cancer Institute. July 2019.
7. Mays D, Murphy SE, Bubly R, Atkins MB, Tercyak KP. Support for indoor tanning policies among young adult women who indoor tan. *Translational behavioral medicine.* 2016 Aug 5;6(4):613-21.
8. Colantonio S, Bracken MB, Beecker J. The association of indoor tanning and melanoma in adults: systematic review and meta-analysis. *J Am Acad Dermatol* 2014;70:847–57.
9. Green AC, Williams GM, Logan V, Strutton GM. Reduced melanoma after regular sunscreen use: randomized trial follow-up. *J Clin Oncol.* 2011;29(3):257-63.
10. Wesson KM, Silverberg NB. Sun protection education in the United States: what we know and what needs to be taught. *Cutis.* 2003 Jan;71(1):71-4.
11. USPSTF Skin Cancer Prevention: Behavioral Counseling. <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/skin-cancer-counseling2>.
12. U.S. Preventive Services Task Force. March 2018.
13. Balk SJ, Gottschlich EA, Holman DM, Watson M. Counseling on sun protection and indoor tanning. *Pediatrics.* 2017 Dec 1;140(6):e20171680.
14. Akamine KL, Gustafson CJ, Davis SA, Levender MM, Feldman SR. Trends in sunscreen recommendation among US physicians. *JAMA dermatology.* 2014 Jan 1;150(1):51-5.
15. Feldman SR, Fleischer Jr AB. Skin examinations and skin cancer prevention counseling by US physicians: a long way to go. *Journal of the American Academy of Dermatology.* 2000 Aug 1;43(2):234-7.
16. Vasicek BE, Szpunar SM, Manz-Dulac LA. Patient knowledge of sunscreen guidelines and frequency of physician counseling: a cross-sectional study. *The Journal of clinical and aesthetic dermatology.* 2018 Jan;11(1):35.
17. Cac NN, Walling HW, Vest C, Ting W. Differences in perceived importance and personal use of sun protection among primary care physicians are reflected in their clinical practice. *International journal of dermatology.* 2008 Feb;47(2):137-43.
18. Easton AN, Price JH, Boehm K, Telljohann SK. Sun

protection counseling by pediatricians. Archives of Pediatrics & Adolescent Medicine. 1997 Nov 1;151(11):1133-8. 17. Isvy A, Beauchet A, Saiag P, Mahé E. Medical students and sun prevention: knowledge and behaviours in France. Journal of the European Academy of Dermatology and Venereology. 2013 Feb;27(2):e247-51. 18. Hymowitz MB, Hayes BB, Maury JJ, Geller AC. Evaluation of medical students' knowledge, attitudes, and personal practices of sun protection and skin self-examination. Archives of Dermatology. 2006 Apr 1;142(4):523-4. 19. Geller AC, Prout MN, Miller DR, Siegel B, Sun T, Ockene J, Koh HK. Evaluation of a cancer prevention and detection curriculum for medical students. Preventive Medicine. 2002 Jul 1;35(1):78-86.