Results | Frequencies for the study variables are shown in Table 1, which also shows the results of bivariable logistic regression analyses examining correlates of Internet access. Of the 176 study participants, Internet access was reported by 148 (84.1%) and was associated with being younger, having a higher educational level, and having greater knowledge of the ABCDE signs of melanoma. One hundred nineteen of 174 participants (68.4%) reported being at least moderately interested in an Internet-delivered behavioral intervention (Table 2). As shown in the bivariable logistic regression analyses in Table 2, individuals who were at least moderately interested in an Internet-delivered behavioral intervention were more likely to be younger, have greater knowledge of the ABCDE signs of melanoma, and be more comfortable using the Internet.

Discussion | As expected, most of the study participants had access to the Internet. Internet access was associated with being younger and having a higher level of education. Most of the participants were at least moderately interested in an Internet-delivered behavioral intervention. Older participants, individuals with lower knowledge of the ABCDE signs of melanoma, and those who reported less comfort using the Internet exhibited less receptivity to an Internet-delivered intervention. These results suggest that individuals who may not perform SSEs effectively (ie, those with low knowledge of the ABCDE signs of melanoma) may be less receptive to an Internet-delivered intervention. Developers of e-health interventions should consider and address such challenges. Formative research should consider ways to improve the appeal of Internet-delivered and/or non–Internet-delivered interventions to those groups who were less receptive or who lacked Internet access.

Among participants with Internet access, receptivity to an Internet-delivered behavioral intervention did not differ significantly based on previous online seeking of melanoma information. Thus, e-health interventions may still appeal to patients with melanoma who have not sought melanoma information online in the past. This work highlights potential limitations of the reach of e-health interventions and identifies factors associated with the receptivity of patients with melanoma to such interventions. Limitations of this study include the cross-sectional nature of the data and inclusion of patients from a single institution. Little research has formally evaluated e-health interventions that promote SSEs and sun protection behaviors among patients with melanoma or individuals at increased risk for melanoma, and future research is warranted to develop and test relevant theory-based interventions.

Ashley K. Day, PhD
Jerod L. Stapleton, PhD
Sharon L. Manne, PhD
Kristina L. Tatum, MS
James S. Goydos, MD
Elliot J. Coups, PhD

Seasonal and Geographic Patterns in Tanning Using Real-Time Data From Google Trends

The incidence of skin cancer is increasing, partly due to the usage of tanning beds.1-3 Few studies have considered the temporal pattern of tanning, with most of the previous studies using cross-sectional data from surveys that are prone to bias of memory recall by individual participants. Herein, we demonstrate a novel methodology and use Internet search data to elucidate seasonality and peak interest times in tanning practices.

Methods | The data in this study were collected from Google Trends.4 For a given search term, Google Trends computes how many searches have been done relative to the total number of searches done on Google.

We investigated the seasonality of interest in using artificial tanning using the search term tanning salon. Other search terms, such as indoor tanning, tanning booth, tanning solarium, and tanning bed, were considered and analyzed. Because these terms resulted in trends similar to those for the term tanning salon, the analyses for them were not included.
The term UV-free tanning, a type that may also occur at tanning salons, did not yield sufficient search results, and therefore this phrase was not analyzed. A more general term, tanning, was chosen to capture a general interest in tanning.

Normalized search volumes (NSVs) were used from January 2004 to December 2013 for both tanning and tanning salon for Canada, United States, and Australia. Within a given country, time series, mean ratios, seasonal plots, and cosinor analysis were used to identify peak interest times and to test the hypothesis that there was significant seasonal variation in normalized search volume over time. R software, version 3.0.2, was used for statistical analysis. Ethics approval was waived per the University of British Columbia’s ethics review board guidelines.

Results | The interest in tanning and tanning salons was highest in March in Canada and the United States, and September for Australia (P = .03). There was a 6-month phase shift for the interest peaks between Australia and the North American counterparts (Figure). Cosinor analysis confirmed this finding, with statistically significant seasonal effects found for tanning salon and tanning for all 3 countries (Table). There was a similar overall trend present with a significant decrease in interest in tanning salons from 2010 onward.

Discussion | Our results demonstrate that interest in tanning peaks prior to summer months, with the highest interest being during the month of March in Canada and the United States. This could be due to variety of reasons, including preparation of a “base tan” prior to embarking on a vacation during March (spring) break or prior to the summer months. Currently in Canada, tanning safety educational campaigns begin in May or June of each year during the beginning of the summer. Considering our findings, having educational campaigns earlier during the year may help optimize harm reduction and prevention of excessive UV radiation exposure.

According to our findings, the interest in tanning salons and indirectly the use of tanning beds has been declining in Canada since 2010, and in United States and Australia since 2012. New regulation banning indoor tanning could be contributing to the decreasing trend observed. Although this is promising, further studies are needed to confirm these findings.

There are few limitations associated with the methodology introduced in this study. Age may influence an individual’s choice to use the Internet as a source for information. This, however, may not be of significance in this study, because tanning and use of tanning beds are typically popular among the Internet-savvy young individuals. Although Google Trends does not capture the characteristics of the individuals entering search queries, it has been shown that Internet queries are an accurate proxy for real-life behavior.

Conclusions | Internet search data revealed interest in tanning practices to be seasonal, with peak times in March in Canada and the United States. Our results enable the design of timely

<table>
<thead>
<tr>
<th>Search Term</th>
<th>Canada</th>
<th>United States</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanning salon</td>
<td>Peak: 3.3 (March); trough: 9.3 (September)</td>
<td>Peak: 3.7 (March); trough: 9.7 (September)</td>
<td>Peak: 9.6 (September); trough: 3.6 (March)</td>
</tr>
<tr>
<td>Tanning</td>
<td>Peak: 3.9 (late March); trough: 9.9 (October)</td>
<td>Peak: 3.7 (late March); trough: 9.7 (October)</td>
<td>Peak: 10.5 (October); trough: 4.5 (April)</td>
</tr>
</tbody>
</table>

* The values represent the month of the year (January, 1; December, 12) with the highest and lowest interest in search terms with the corresponding country. P = .03 for all comparisons.
harm reduction interventions. Our study introduces a novel methodology that may be used to contribute to research in the field of dermatology. Further studies are needed to confirm these findings.

Bez Toosi, MD
Sunil Kalia, MD, MHSC, FRCPC

Author Affiliations: Department of Dermatology and Skin Science, University of British Columbia, and Photomedicine Institute, Vancouver Coastal Health, Vancouver, Canada.

Corresponding Author: Bez Toosi, MD, Dermatology and Skin Science, University of British Columbia, B33 W 10th Ave, Vancouver, BC V5Z 4E8, Canada (toosi@alumni.ubc.ca).

Accepted for Publication: August 16, 2015.


Author Contributions: Both authors had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Both authors.

Acquisition, analysis, or interpretation of data: Both authors.

Drafting of the manuscript: Both authors.

Critical revision of the manuscript for important intellectual content: Kalia.

Statistical analysis: Both authors.

Administrative, technical, or material support: Both authors.

Study supervision: Both authors.

Conflict of Interest Disclosures: None reported.


Nevoid Anemicus and Bier Spots in Tuberous Sclerosis Complex

Vascular lesions, such as nevoid anemicus and Bier spots, are benign functional abnormalities.1-3 Four patients described herein with tuberous sclerosis complex (TSC) had nevoid anemicus or Bier spots.

Methods | A retrospective descriptive analysis was performed of skin signs in 29 sequential patients with TSC who were examined by the same dermatologist (D.L.) over 10 years. All patients had a definite diagnosis of TSC according to criteria from the 2012 International Tuberous Sclerosis Complex Consensus Statements.4 A detailed and complete dermatological examination was performed at least once in all patients. This type of study that does not involve invasive investigation but relies on a clinical examination performed during a regular consultation does not need the approval of an institutional review board under French law.

Results | Classic dermatological findings of TSC were observed in 29 patients (Table). The following 4 patients had nevoid anemicus of Bier spots.

Patient 1. A woman in her 30s with renal cysts had angiofibromas, shagreen patches, and ungual fibromas. In addition, she manifested 2 subependymal nodules, cortical dysplasia, and renal angiomyolipomas, and she was found to have a TSC1 (OMIM 605284) mutation. Dermatological examination also revealed a nevoid anemicus on the thorax.

Patient 2. As a young girl, this patient was thought to have TSC because she had epilepsy, cortical dysplasia, and hypomelanotic macules. She was first examined in the Clinique Dermatologique, Hôpitaux Universitaires de Strasbourg, when she was in her early 20s. Angiofibromas, 2 ungual fibromas, hypomelanotic macules, 2 shagreen patches, and dental enamel pits were noted, as was a left thoracic nevoid anemicus (Figure). She also had subependymal nodules, renal cysts, and renal angiomyolipomas.

Patient 3. A 5-month-old boy with a history of cardiac rhabdomyolipomas found on antenatal ultrasonography and West syn-