

UC Davis

Dermatology Online Journal

Title

Comprehensive outreach, prevention education, and skin cancer screening for Utah ski resorts

Permalink

<https://escholarship.org/uc/item/8d82g9vk>

Journal

Dermatology Online Journal, 24(2)

Authors

Varedi, Amir
Secrest, Aaron M
Harding, Garrett
et al.

Publication Date

2018

DOI

10.5070/D3242038187

Copyright Information

Copyright 2018 by the author(s). This work is made available under the terms of a Creative Commons Attribution-NonCommercial-NoDerivatives License, available at <https://creativecommons.org/licenses/by-nc-nd/4.0/>

Comprehensive outreach, prevention education, and skin cancer screening for Utah ski resorts

Amir Varedi^{1*} MPH, Aaron M Secrest^{1,2*} MD PhD, Garrett Harding³ BS, Lori Maness⁴ MBA, Donna Branson³ BA, Kristi Smith⁵ BS, Christopher M Hull¹ MD

Affiliations: ¹Department of Dermatology, University of Utah, Salt Lake City, Utah, ²Department of Population Health Sciences, University of Utah, Salt Lake City, Utah, ³Huntsman Cancer Institute, University of Utah, Salt Lake City, Utah, ⁴Department of Internal Medicine, University of Utah, Salt Lake City, Utah, ⁵Utah Cancer Action Network, Utah Department of Health, Salt Lake City, Utah

*These authors contributed equally to the manuscript

Corresponding Author: Christopher M. Hull MD, Department of Dermatology, University of Utah, 30 N 1900 E, 4A330, Salt Lake City, UT 84132, Tel: 801-581-6465, Fax: 801-581-6484, Email: christopher.hull@hsc.utah.edu

Abstract

Outdoor recreation can lead to substantial sun exposure. Employees of outdoor recreation establishments with extended time outdoors have amplified cumulative exposure to ultraviolet (UV) radiation and an increased risk of skin cancer. The “Sun Safe on the Slopes” program was created by Huntsman Cancer Institute at the University of Utah and the Utah Cancer Action Network to address increased UV exposure and skin cancer risk with free skin cancer screenings, outreach, and prevention education to local ski resorts. Herein, we describe the processes and barriers to implementation of a ski resort skin screening and education program and our 5-year report of the experience and screening data. Nine free skin cancer screenings were held at Utah ski resorts between 2011 and 2016, resulting in the presumptive diagnosis of 38 skin cancers (9.6%) in 394 participants. Behavioral data collected from participants indicates suboptimal sun safety practices, including underuse of sunscreen and protective clothing. Ski resort employees who experience sun exposure during peak hours at high altitudes and UV reflection from the snow are at an increased risk of skin cancer. These data indicate a need for emphasis on sun safety education and screening and can serve as a model for future endeavors.

Keywords: skin cancer screening, patient education, health promotion, skin cancer prevention, community outreach, UV protection, sunscreen

Introduction

Improving public adoption of skin cancer preventive behaviors as well as optimizing regular skin screenings continue to be great public health challenges in the United States. Rising skin cancer incidence figures nationwide have led to an increased focus on public awareness of demographic and behavioral factors placing individuals at greater risk. Utah has the highest incidence rate of melanoma (34.6 annual incidence per 100,000) in the United States, with elevated rates occurring not only in non-Hispanic whites, but also in Hispanics [1]. Utah is also among the top ten states in overall skin cancer incidence [2]. Potential contributing factors include a predominantly light-skinned population, high altitude, and an active year-round outdoor lifestyle. Utah is well known as a premier ski and snowboard destination with 14 ski resorts in the state, many of which also offer mountain biking and hiking in the summer.

A review of several large epidemiological studies demonstrated individuals who participate in outdoor sports have increased skin cancer rates; skiers in particular are at increased risk for squamous cell carcinoma [3, 4]. These athletes were also found to have misinformation regarding the risks they face

in participating in outdoor sports. Guests of hotels and resorts intended for outdoor recreation have been found to be at high risk for UV exposure [5]. Resort employees, however, are a particularly vulnerable population in that they are often outdoors for extended periods of time throughout the winter season, and potentially year-round, increasing their cumulative UV exposure. A study assessing the effectiveness of an employee screening program ($n=783$) in a technical company successfully identified suspicious nevi and identified persons at higher risk who needed regular follow-up with a dermatologist [6].

Health promotion policies in ski and snowboard schools have demonstrated an increase in sun safe practices and improved recall of educational messages [7]. Sun safe educational interventions for children have been implemented and described, but such primary prevention efforts have not been reported in outdoor employee populations [8, 9]. In addition, free skin cancer screenings can provide secondary prevention efforts for early detection of melanoma and other skin cancers [10]. A pilot study with state park employees in the southern U.S. assessing knowledge and practices regarding skin cancer prevention behaviors indicated a need for employer-sponsored education programs [11]. Herein, we describe the processes and barriers to

implementation of instituting a ski resort skin screening and education program, focusing on both primary and secondary prevention. Such an undertaking requires a commitment from several stakeholders: ski resorts, including management and their employees and dermatologists in the area (either through a state dermatologic society or coordinated by an academic dermatology department). In addition, educational support from a state cancer coalition or local cancer networks is needed. Access to employees on-site can circumvent some of the barriers that limit community screening [12].

Case Synopsis

Methods

“Sun Safe on the Slopes” began in 2011 as a joint effort between two Utah ski resorts, Huntsman Cancer Institute (HCI) and the Department of Dermatology at the University of Utah (U of U), and the Utah Cancer Action Network (UCAN), a comprehensive cancer control coalition comprised of a diverse, professional group of stakeholders across the state. The goal was to provide comprehensive outreach, prevention education, and skin cancer screening to ski resort employees. Two



Figure 1. A) Final version of the “Sun Safe on the Slopes” logo with a website address. This was used on all educational and marketing materials and stickers were provided to ski resort employees and guests. **B)** “Sun Safe on the Slopes” educational homepage.

Utah resorts (Deer Valley Resort® and Snowbird Ski and Summer Resort®) participated in the initial planning and implementation of this program titled “Sun Safe on the Slopes” (**Figure 1A**).

The two participating ski resorts have mid-mountain altitudes of 8100 feet (2470 m) and 9550 feet (2910 m), respectively. This program includes: employee sun safety training; access to sunscreen for employees and guests; ski school sun safety curriculum; posters about sun safety; skin cancer prevention information at employee health fairs; and annual free skin cancer screenings by dermatology providers. UCAN provided funding for sunscreen and sunscreen dispensers purchased through the Arizona Cancer Center's Protect Your Skin Program and were provided to any ski resort who requested them, with the long-term goal that ski resorts would budget for employee/guest sunscreen in future years. Coloring books targeted at children, which included skin cancer prevention education were created for distribution in ski and snowboarding classes. Informational posters were created and distributed at local ski resorts that provided tips to reduce UV exposure (e.g., regular sunscreen application, protective clothing). Health educators from HCI also attended health fairs held at the ski resorts to provide free lip balm and sunscreen samples, as well as conduct educational sessions regarding skin cancer prevention – a sample video is available on the “Sun Safe on the Slopes” website, www.sunsafeontheslopes.org (**Figure 1B**).

This website was developed as part of HCI's community outreach efforts and is a free resource to connect ski resort employees and guests to the content created for the program. It includes printable educational posters and other downloadable resources, an educational video regarding the goals of the program, as well as general information about sun safety, local skin cancer screenings, and a curriculum of three 5-minute lessons to teach preventive behaviors in ski and snowboarding schools for children and adults. It may also serve as an accessible resource to anyone who could benefit from its content, including those interested in developing similar programs at other ski resorts both in the U.S. and internationally.

University of Utah Department of Dermatology faculty and residents, supported by University of Utah medical students and HCI Community Outreach and Prevention Education staff, volunteered annually to conduct total body skin examinations at participating ski resorts. Over a 5-year period, a total of nine skin cancer screenings have occurred (2011-2016). The screenings followed the American Academy of Dermatology (AAD)'s SPOTme® screening guidelines. AAD surveys include areas for noting participants' skin cancer history, demographic information, sun safety behaviors and recommendations for follow-up; body maps allow quick documentation of the anatomical location of lesions identified during screening. Data were compiled in Microsoft Excel v15 (Redmond, WA) and analyzed using SPSS v24 (Chicago, IL). A p-value of 0.05 was considered significant.

Results

A total of 394 persons (52% female, 96% white, mean age = 47 years) were screened, resulting in the presumptive diagnosis of 38 (9.6%) skin cancers (25 basal cell carcinomas, 4 squamous cell carcinomas, 9 melanomas), (**Figure 2**). Given the anonymity of the screening, none of the subsequent follow-up data, including biopsy reports, were available. A total of 87 actinic keratoses and 42 dysplastic nevi were also identified. Biopsy was recommended for 80 (20%) individuals and 141 (36%) were referred for further evaluation. Thirty-nine (10%) individuals reported a

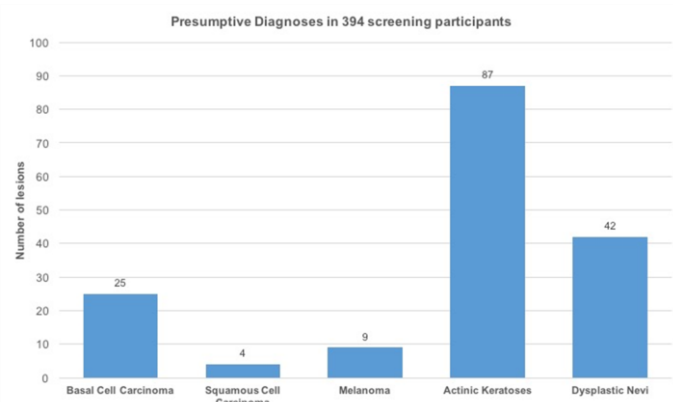


Figure 2. Presumptive lesion diagnoses from nine ski resort skin screening examinations between 2011 and 2016 in 394 total participants.

previous skin cancer diagnosis. Of the responding participants, 41% indicated they would not have seen a physician for their skin if they had not participated in a free screening. Only 38% of participants indicated always using sunscreen while outdoors and 32% reported always seeking shade when possible. Sun protective clothing was reported as always worn by 13% of participants.

Discussion

The “Sun Safe on the Slopes” program serves an at-risk population with health concerns not previously being addressed. The screenings yielded an alarming rate of 9.6% of participants with presumed skin cancers. More than 40% of participants indicated they would not have sought a physician for a skin examination had they not participated in a screening. Arranging for screenings to take place at the site of employment allows for convenient access by employees and improves overall number screened. The “Sun Safe on the Slopes” program could be adopted to meet the needs of other resorts to address these issues and ultimately lead to better outcomes for both ski resort employees and guests.

Nearly half of all participant responses indicated less than optimal skin cancer prevention behaviors (i.e., poor use of sunscreen and/or sun protective clothing), demonstrating the potential for behavioral modifications through education to optimize sun protection. The implementation of preventive on-site education, in conjunction with on-site screening, aimed at affecting these behaviors could contribute to earlier detection and decreased incidence of skin cancer in this high-risk population. The results of these screenings indicate a need for further data collection and expansion into other ski resorts. The primary aim of this publication is to provide a roadmap for others in their efforts to implement

References

1. Sweeney C., Hergert KA, Otto VY, McFadden S, Millar MM. *Cancer in Utah: An Overview of Incidence and Mortality 2004-2013*. Utah Cancer Registry, 2016.
2. National Cancer Institute (NCI), Centers for Disease Control and Prevention (CDC). *State Cancer Profiles*.

similar primary and secondary prevention programs in other high-risk outdoor employee populations.

Future studies can administer pre-and post-tests to assess knowledge of sun safety in both employees and guests, identify demographic and behavioral characteristics of high-risk screening participants, and expand the educational tools beyond those developed for “Sun Safe on the Slopes.” Examining the rates of particular presumptive diagnoses and skin cancer preventive behaviors will help determine the long-term impact of these interventions. Nearly half of all participant responses indicated less than optimal skin cancer prevention behaviors (i.e., poor use of sunscreen and/or sun protective clothing), demonstrating the potential for behavioral modifications through education to optimize sun protection. The implementation of preventive on-site education, in conjunction with on-site screening, aimed at affecting these behaviors could contribute to earlier detection and decreased incidence of skin cancer in this high-risk population.

Conclusion

The primary aim of this publication is to provide a roadmap for others in their efforts to implement similar primary and secondary prevention programs in other high-risk outdoor employee populations. Future studies can administer pre-and post-tests to assess knowledge of sun safety in both employees and guests, identify demographic and behavioral characteristics of high-risk screening participants, and expand the educational tools beyond those developed for “Sun Safe on the Slopes.” Examining the rates of particular presumptive diagnoses and skin cancer preventive behaviors will help determine the long-term impact of these interventions.

www.statecancerprofiles.cancer.gov. Accessed on September 17, 2017.

3. Moehrle M. Outdoor sports and skin cancer. *Clin Dermatol*. 2008;26(1):12-5. Epub 2008/02/19. [PMID: 18280899].
4. Serrano MA, Canada J, Moreno JC, Gurrea G. Personal UV exposure for different outdoor sports. *Photochem Photobiol Sci*. 2014;13(4):671-9. Epub 2014/02/19. [PMID: 24535504].

5. Buller DB, Andersen PA, Walkosz BJ, Scott MD, Beck L, Cutter GR. Rationale, design, samples, and baseline sun protection in a randomized trial on a skin cancer prevention intervention in resort environments. *Contemp Clin Trials*. 2016;46:67-76. Epub 2015/11/26. [PMID: 26593781].
6. Uslu U, Hees F, Winnik E, Uter W, Sticherling M. Effectiveness of an employee skin cancer screening program for secondary prevention. *Cutis*. 2016;98(2):113-9. Epub 2016/09/14. [PMID: 27622254].
7. Walkosz BJ, Buller DB, Andersen PA, Scott MD, Liu X, Cutter GR, Dignan MB. Translation of a Ski School Sun Safety Program to North American Ski and Snowboard Schools. *Health Promot Pract*. 2015;16(4):560-70. Epub 2015/03/13. [PMID: 25761916].
8. Townsend JS, Pinkerton B, McKenna SA, Higgins SM, Tai E, Steele CB, Derrick SR, Brown C. Targeting children through school-based education and policy strategies: comprehensive cancer control activities in melanoma prevention. *J Am Acad Dermatol*. 2011;65(5 Suppl 1):S104-13. Epub 2011/11/02. [PMID: 22018059].
9. Rosenberg C, Mayer JA, Eckhardt L. Skin cancer prevention education: a national survey of YMCAs. *J Community Health*. 1997;22(5):373-85. Epub 1997/11/14. [PMID: 9353684].
10. Schneider JS, Moore DH, 2nd, Mendelsohn ML. Screening program reduced melanoma mortality at the Lawrence Livermore National Laboratory, 1984 to 1996. *J Am Acad Dermatol*. 2008;58(5):741-9. Epub 2007/12/11. [PMID: 18068264].
11. Nahar VK, Ford MA, Boyas JF, Brodell RT, Hutcheson A, Davis RE, Beason KR, Bass MA, Biviji-Sharma R. Skin cancer preventative behaviors in state park workers: a pilot study. *Environ Health Prev Med*. 2014;19(6):467-74. Epub 2014/10/02. [PMID: 25271053].
12. Cariou C, Gonzales M, Krebill H. Adapting and implementing an evidence-based sun-safety education program in rural Idaho, 2012. *Prev Chronic Dis*. 2014;11:E77. Epub 2014/05/09. [PMID: 24809363].