Veterans Speak Up: Current Warnings on Skin Cancer Miss the Target, Suggestions for Improvement

Valerie Fisher, MS4; Deborah Lee, MD*; John McGrath, PhD†; Jennifer Krejci-Manwaring, MD*†*

ABSTRACT Background: Skin cancer is the most common cancer in the world and its incidence is increasing. Veterans may have increased exposure to risk factors, but data are lacking in terms of their perceptions of skin cancer and the types of prevention strategies that might resonate with this population. Objective: This study examines veterans' awareness of the risk factors for skin cancer and importance of sun protection and seeks to identify effective communication and educational strategies for this at-risk population. Methods: A telephone survey was conducted of 100 veterans, who have been diagnosed with skin cancer at the Audie Murphy Veteran's Hospital in San Antonio, Texas. Results: The majority of respondents' said that their skin cancer resulted from sun exposure and that the best way to prevent skin cancer was to use sunscreen. However, when asked if they believed they were at risk for being diagnosed with skin cancer, most veterans responded that they believed they were at little risk. In response to why veterans did not heed warnings about skin cancer, many replied that they believed skin cancer would not happen to them. A statistically significant increase in usage of sunscreen and sun protectant garments occurred after being diagnosed with skin cancer and education by their physicians. Doctors talking to patients was rated the most effective communication method to inform them about the risks of skin cancer, followed by education during basic training. Limitations: Recall bias is the major limitation with a retrospective survey design. Discussion: Our results reveal poor patient awareness of the risks of skin cancer and the benefits of sun protection before their diagnosis. The veterans agreed that the physician–patient interaction is the best and most effective means of communication, which is evident by the significant increase in sun protection and sunscreen usage after their diagnosis. Our survey revealed that other effective communication strategies included education in basic training, the use of a veteran spokes model with skin cancer, and the use of images to emphasize the severity of the disease.

BACKGROUND

Skin cancer is the most common form of cancer in humans and it is also the most preventable form of cancer.[1–3] The incidence of skin cancer is five times higher than that of breast or prostate cancer and currently, the incidence of skin cancer in the United States is greater than all other forms of cancer combined.[4] Skin cancer represents a major medical health problem that is on the rise. Data from national databases indicate that the incidence of skin cancer in the United States has substantially increased from 1992 through 2006 and is now approximately double from the last published estimate from 1994.[1] In 2004, the estimated annual cost of nonmelanoma skin cancer (NMSC) was $1.451 billion in direct medical costs and $961 million in indirect medical costs.[5]

Age-specific NMSC detection in individuals over age 50 in the veteran population exceeded age-adjusted incidence rates for NMSC in the general U.S. population.[6] One study identified risk factors predisposing veterans toward being diagnosed with skin cancer.[2] In this study, parents' ethnicity, actinic keratosis on the face and other anatomic sites, solar elastosis of the neck, facial telangiectasias, age of first sunburn, and residency status in Indiana were risk factors related to veterans developing skin cancer.[2] Veterans may also be in a lower socioeconomic bracket, a population that have a decreased melanoma risk perception and knowledge as well as decreased physician communication regarding need for skin examinations. All of these factors may contribute to the consistently observed socioeconomic gradient in mortality.[7] However, no studies have attempted to describe Veterans' understanding and perception of skin cancer, nor has any study identified the types of health-risk messages that might resonate with this population. Identifying risk factors for skin cancer is helpful, but it is also important to understand how best to educate and communicate with this specific population, which appears to be at greater risk than the general population.

Veterans generally have more extensive environmental exposure, naturally or experimentally, and at a younger age than the general population.[2] Identifying the best way to communicate the risks of skin cancer to military personnel and veterans is key in preventative measures because findings show that solar radiation at a young age to be especially contributory to skin cancer risk.[2] The elderly are more at risk of skin cancer because their skin is less able to mobilize the immune system to defend itself.[8] The purpose of this study was to explore veterans' knowledge of skin cancer risks, as well as their attitudes about engaging in risky or preventative behavior. We also explored their perceptions of the effectiveness of various sources of health-risk information and identified specific reasons patients may

*University of Texas Health Science Center, San Antonio, Division of Dermatology and Cutaneous Surgery, Cancer Therapy Research Center (CTRC), 7979 Wurzbach Road, Mail Code 7876, San Antonio, TX 78229-4427.

†Audie L. Murphy Veteran's Hospital, Department of Dermatology, 7400 Merton Minter, San Antonio, TX 78229.

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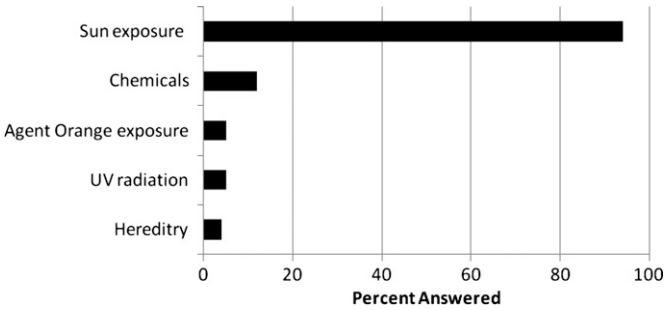

FIGURE 1. Perceived causes of skin cancer.

not follow medical guidelines, instructions, and warnings related to skin cancer.

METHODS

Through the use on an electronic records query, 877 veterans from the Audie Murphy Veteran's Hospital in San Antonio were identified as having been diagnosed with skin cancer from 2009 to the present. Potential subjects were informed of the study by mail after which time they were contacted by telephone to participate and answer survey questions related to their knowledge about skin cancer. Demographic information, that is, name, address, and phone numbers, of the 877 potential subjects were contained within an Excel spreadsheet sorted by city of residence. Three research assistants divided the list into 3 parts and called participants until a total of 100 respondents was obtained. The list of questions included the following open ended queries (see Appendix for full questionnaire):

(1) What is your understanding of how a person gets skin cancer?
(2) How do you prevent skin cancer?
(3) When did you learn about skin cancer?
(4) Where did you get your information about skin cancer?
(5) Why do you think some Veterans do not listen to warnings about skin cancer?
(6) Is there anything else the military could do to help prevent skin cancer among veterans?

Respondents were allowed to give more than one answer to open-ended questions. Responses from the survey for each Veteran were deidentified and were entered into a separate spreadsheet on Microsoft Excel where the data were able to be stored anonymously and analyzed. This study was approved by the University of Texas Health Science Center Institutional Review Board and the Veterans Administration (VA) Research & Development committee.

RESULTS

The sample size for our study included 100 veterans (99 male respondents, 1 female respondent). The mean age was 69 years old with a range of 48 to 95 years old and a median age of 65 years. Fifty-five respondents were born in the state of Texas while the average years lived in Texas was 48 (range 2–95 years). The average age when asked what age they first learned about skin cancer was 37 years.

As to their understanding about the causes of skin cancer, the most common response from the veterans was that they got skin cancer because of exposure to the sun (94%). After sun exposure, other causative agents were believed to be: chemicals (12%), UV radiation (5%), Agent Orange exposure (5%), and heredity (4%) (Fig. 1).

In terms of preventing skin cancer, veterans responded that wearing sunscreen (63%) was an important measure. Also suggested were preventative measures such as staying out of the sun (44%), wearing a wide brimmed hat (43%), and wearing a long sleeved shirt (42%) (Fig. 2).

When asked if they believed they were at risk for being diagnosed with skin cancer, most veterans responded that they believed they were at little risk (perceived risk response score = 2.2 out of 5; 1 being no risk and 5 being high risk).

We also asked veterans about which communication methods would work best to inform them about the risks

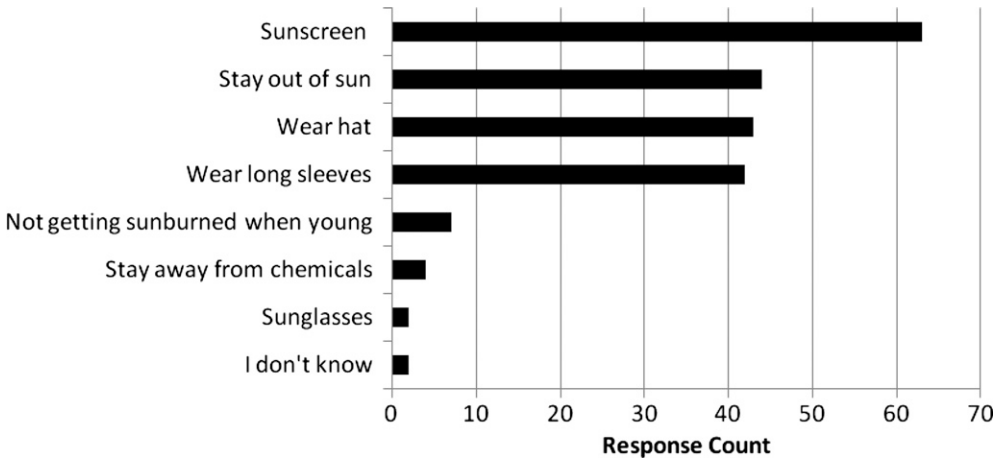

FIGURE 2. How to prevent skin cancer.

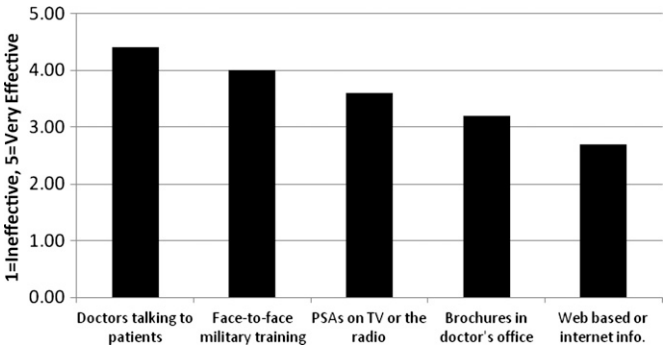

FIGURE 3. Effective methods of communication.

TABLE I. Use of Sunscreen and Protective Clothing

	Before Diagnosis of Skin Cancer	After Diagnosis of Skin Cancer	t[198]	p Value
Sunscreen	2.02	2.94	5.18	$p < 0.0001$
Hat/Long Sleeves	2.42	3.87	7.60	$p < 0.0001$

associated with skin cancer. We measured their responses on a scale of 1 to 5, with 1 being ineffective and 5 being very effective. Doctors talking to patients was rated the most effective communication method with an average rating of 4.4. Other methods of communication surveyed included face-to-face military training about skin cancer (4.0), public service announcements on television or the radio (3.6), brochures in a doctor's office (3.2), and World Wide Web based or internet information (2.7) (Fig. 3).

In terms of behavior changes before and after receiving a skin cancer diagnosis, veteran responses indicated that their use of sunscreen and protective clothing increased significantly after being diagnosed with skin cancer (sunscreen use before = 2.02 and after = 2.94, t[198] = 5.18, $p < 0.0001$; protective clothing usage before = 2.42 and after = 3.87, t[198] = 7.60, $p < 0.0001$) (Table I).

In response to why veterans did not heed warnings about skin cancer, many replied that they believed skin cancer would not happen to them (60 responses). Other replies included lack of information (18), other medical problems were more concerning (8), sunscreen was a hassle or unappealing (8), believing they were invincible (6), and believing their skin color protected them from skin cancer (4) (Fig. 4).

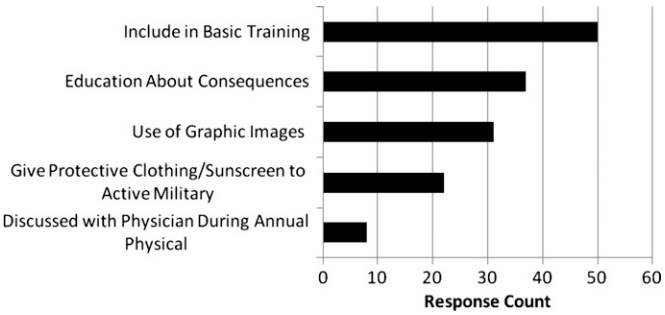

FIGURE 5. What the military can do to help prevent skin cancer.

Finally, respondents were asked if there was anything the military could do to help prevent skin cancer in veterans. The most popular answer was that skin cancer prevention and safety should be discussed during basic training. Other responses included having the military educate soldiers on the consequences of sun exposure and the use of graphic images in their teaching (Fig. 5).

DISCUSSION

The survey data provided many insights into the veteran populations' understanding of skin cancer. Most study participants had knowledge regarding sun and ultraviolet light as risks for developing skin cancer and that avoidance of these risks through sunscreen, sun avoidance, and protective clothing could prevent it. However, respondents clearly did not consider themselves to be at risk before their diagnosis since the majority of respondents replied that they believed they were at "little risk." After the diagnosis of skin cancer, statistically significant changes occurred in regards to the veterans' sun protective behavior. Changes included using sunscreen more often and wearing protective clothing. This

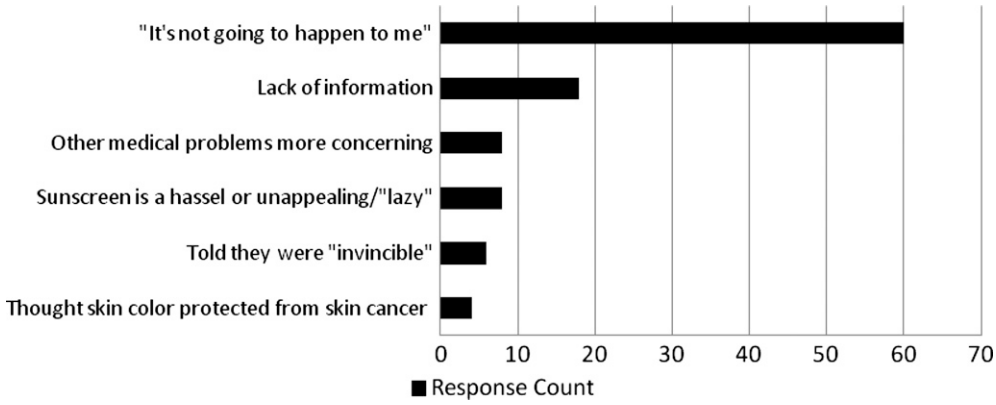

FIGURE 4. Why do you think veterans do not listen to warnings about skin cancer?

suggests that the current message from physicians to veterans may influence their sun protectant behaviors.

In terms of communicating with veterans, they reported that dermatologists and other doctors talking to veteran or active duty patients about skin cancer is the most important method by which to inform this group of individuals about the increased risks they face. However, U.S. primary care physicians say they address skin cancer less than half the time with their typical patients.[9] From our data, it would suggest veterans will respond to warnings by physicians, both dermatologists and nondermatologists and more skin cancer intervention should be discussed through routine visits for veterans and active military personnel.

Study participants overwhelmingly agreed that there should be education in basic training or throughout active duty about the consequences of sun exposure and skin cancer. Specifically, they cited that information about skin cancer should be imparted during Basic Training First Aid training, or during Commander's Call and should focus on educating about consequences. They also reported that graphic imagery might be an effective means by which to help both active and retired service men understand the importance of skin cancer warnings. Imagery has proven to be an effective tool in other prevention campaigns such as anti-tobacco and drunk driving.[3] Our results suggest the same could be true if veterans were to see disfiguring photos of people with skin cancer.

During numerous personal encounters by Jennifer Krejci-Manwaring, many common stories arise from soldiers and veterans during routine history taking and examinations. Vietnam-era soldiers describe using mud to cover their faces and necks from the blistering sun. Similarly, veterans from Iraq and Saudi relate stories of covering themselves with dirt or sand to avoid sunburns. Anecdotally, we are aware of the increased sun exposure involved in some military activities and yet sunscreen is not a part of their issued supplies. In terms of instituting interventions to effect sun protective behavioral change within the established military system, it is important to realize that a successful program must balance learning and behavioral modification.[10] The participants in this study were well acquainted with the military system and the VA system and therefore in a unique position to suggest effective strategies geared toward creating interventions to educate military personnel regarding the risks associated with skin cancer. Results of several studies have shown an increase in knowledge and attitudes related to sun protection, but few interventions have been successful in changing sun protection behaviors.[11] One study aimed at changing sun exposure behaviors and habits of children and adolescents points out that if sun protective behavior can be established as a habit in early life, less resistance may be encountered.[10] Habitual behaviors, through repetition, become fixed, automatic, and easily carried out.[10] In keeping with this analogy, if a system of sun protective behavior can be introduced at the beginning of a military recruit's training period, this may lead to a reduced risk of skin cancer later in that individual's lifetime. In addition, less resistance may be encountered with sun protective behavior than if this system is introduced at the end of that individual's time in military service. A new behavior that opposes previously established patterns is more difficult to integrate into an individual's routine; therefore, training a military recruit earlier could have a significant benefit.

Only a few intensive, multicomponent interventions have been attempted in the United States aiming to educate and activate adults to role model and actively promote sun-protection practices while creating a pro-sun protection community environment.[10] However, these have achieved success in changing behavior practices related to sun exposure showing increased body surface area protected and increased sun screen use in adolescents in the intervention sites.[10] Another study performed in an adult population in Australia found that campaigns need to include persuasive mass media advertising, public relations, role modeling by well-known leaders in various population segments, and health education programs available to all school levels, parents, and child care providers.[12] For example, for the veteran and active military population, prominent role models within the military and veteran community can utilize publicity to speak about skin cancer prevention behavior and awareness. Jessica Simpson (singer/actress) made certain acne treatments very popular and Phil Mickelson (golfer) brought treatment of psoriasis to the mainstream. Although some veterans may know that John McCain (presidential nominee) had melanoma, it was not widely advertised during his campaign trail. Finding a spokesperson that speaks to veterans is important. The right public figure might be able to convince veterans and military personnel to make sun protection a part of their daily routine or even start a new trend for wearing hats.

When comparing sun protection to other health campaigns, abstinence from smoking or alcohol saves a person's money they might spend on these items. Women getting a mammogram or a colonoscopy for both men and women for early detection of breast or colon cancer is also part of routine screening examinations and covered for all military/veterans. However, when it comes to sun protection, it requires sunscreen, clothing, and/or hats, which could be cost prohibitive to many veterans. It would therefore be essential to have effective, inexpensive sunscreen and other items available to active and retired military personnel and veterans.

One common theme prevails in literature related to interventions that bring about behavioral changes to prevent skin cancer.[13] The theme is that dermatologists can provide leadership when it comes to designing, implementing, and evaluating intervention strategies in addition to assuring allocation of resources for skin cancer prevention.[13] Dermatologists are regarded as experts in skin cancer prevention, diagnosis, and therapy. They have popularized the idea that most skin cancers can be prevented by lifelong

sun protection. However, the necessity of outdoor occupations, the benefits of outdoor recreation, the surgence of recommendations for sun exposure to promote vitamin D synthesis, and other factors pose significant challenges to the message about sun protection. Dermatologists can start by encouraging their primary care colleagues to discuss skin cancer during routine examinations and providing educational seminars or guiding them to online resources for information on signs of sun damage and skin cancer. For the veteran populations, dermatologists can contribute to the current efforts utilizing electronic and other media for health promotion. The VA's online resource "MyHealtheVet" offers programs promoting smoking cessation, food and activity journals, and MOVE! Weight Management Program, which has helped over 300,000 Veterans lose weight.[14] These same avenues could be modeled for skin cancer awareness.

With a survey design, the results depend on recall which can create bias in the retrospective questioning. However, the results of questions pertaining to subjects' present knowledge, perceptions, and behaviors reflect current information. Another limitation is that our population was 99% male. As the veteran population ages, there is a larger percentage of female veterans that could affect preferences for communication or spokesperson but given that the most preferred communication was that coming from their own physician, it is unlikely that this would differ based on gender.

The information derived from these surveys provided much needed insight that may assist in the development of future educational campaigns with formats and messages that specifically target new recruits, active duty and retired military and veterans. By utilizing the information gained in this study, ideally an effective prevention and intervention strategy can be created that will effectively target the military and veteran personnel and in turn decrease the incidence and prevalence of skin cancer.

APPENDIX

What is your understanding of how a person gets skin cancer? How do you prevent skin cancer?

When did you learn about skin cancer? Where did you get your information about skin cancer?

Some of the ways people might find out about skin cancer include: doctors talking to patients about skin cancer during an office visit, brochures about skin cancer located in the doctor's office, public service announcements about skin cancer on TV or the radio

In your opinion, how effective are these methods for getting information? On a scale of 1 to 5, where 1 is" very ineffective" and 5 is" very effective", could you rate the effectiveness of each method?

	Ineffective	Not Effective	Neutral	Effective	Very Effective
Doctors talking to patients:	1	2	3	4	5
Brochures in doctor's office:	1	2	3	4	5
PSAs on TV or the radio:	1	2	3	4	5
Face-to-face military training:	1	2	3	4	5
Web based or Internet Info:	1	2	3	4	5

Before your diagnosis, on a scale of 1 to 5, where 1 is "no risk", and 5 is "great risk" how would you rate your risk level for getting skin cancer?

"No risk"	Little risk	Some risk	Risky	"Great risk"
1	2	3	4	5

Can you tell us, before you were diagnosed with skin cancer, how often you used sun screen?

"never"	"rarely"	"sometimes "	"often"	"every day"
1	2	3	4	5

Has your use of sun screen changed since your skin cancer diagnosis? Please rate your current use of sun screen.

"never"	"rarely"	"sometimes "	"often"	"every day"
1	2	3	4	5

Can you tell us, before you were diagnosed with skin cancer, how often did you use protective clothing (e.g., wide bring hats and long sleeves)?

"never"	"rarely"	"sometimes "	"often"	"every day"
1	2	3	4	5

Has your use of protective clothing changed since your skin cancer diagnosis? Please rate your current use of protective clothing.

"never"	"rarely"	"sometimes "	"often"	"every day"
1	2	3	4	5

Why do you think some Veterans do not listen to warnings about skin cancer?

Is there anything else you can think of the military could do to help prevent skin cancer among veterans?

Could you please tell us your age?

Where were you born?

How many years have you lived in TX?

Have you seen your dermatologist since your skin cancer was treated?

REFERENCES

1. Rogers HW, Weinstock MA, Harris AR, et al: Incidence estimate of nonmelanoma skin cancer in the United States, 2006. Arch Dermatol 2010; 146(3): 283–7.
2. Chuang TY, Brashear R: Risk factors of non-melanoma skin cancer in United States veterans patients: a pilot study and review of literature. J Eur Acad Dermatol Venereol 1999; 12: 126–32.
3. Dunlop SM, Cotter T, Perez D: When your smoking is not just about you: antismoking advertising, interpersonal pressure, and quitting outcomes. J Health Commun 2014; 19(1): 41–56.
4. Stern RS: Prevalence of a history of skin cancer in 2007: results of an incidence-based model. Arch Dermatol 2010; 146(3): 279–82.
5. Bickers DR, Lim HW, Margolis D, et al: The burden of skin diseases: 2004 a joint project of the American Academy of Dermatology Association and the Society for Investigative Dermatology. J Am Acad Dermatol 2006; 55(3): 490–500.
6. Swetter SM, Waddell BL, Vazquez MD, Khosravi VS: Increased effectiveness of targeted skin cancer screening in the Veterans Affairs population of Northern California. Prev Med 2003; 36(2): 164–71.
7. Pollitt RA, Swetter SM, Johnson TM, Patil P, Geller AC: Examining the pathways linking lower socioeconomic status and advanced melanoma. Cancer 2012; 118(16): 4004–13.
8. Maxmen A: Age-induced T cell troubles. J Exp Med 2009; 206: 1834.
9. Saraiya M, Frank E, Elon L, Baldwin G, McAlpine BE: Personal and clinical skin cancer prevention practices of US women physicians. Arch Dermatol 2000; 136(5): 633–42.
10. Dadlani C, Orlow SJ: Planning for a brighter future: a review of sun protection and barriers to behavioral change in children and adolescents. Dermatol Online J 2008; 14(9): 1.
11. Cummings SR, Tripp MK, Herrmann NB: Approaches to the prevention and control of skin cancer. Cancer Metastasis Rev 1997; 16(3–4): 309–27.
12. Hill D, White V, Marks R, Borland R: Changes in sun-related attitudes and behaviors, and reduced sunburn prevalence in a population at high risk of melanoma. Eur J Cancer Prev 1993; 2(6): 447–56.
13. Glanz K, Halpern AC, Saraiya M. Behavioral and community interventions to prevent skin cancer: what works? Arch Dermatol 2006; 142(3): 356–60.
14. U.S. Department of Veterans Affairs: MOVE! Weight Management Program Home. N.p., July 03, 2006. Available at http://www.move.va.gov/; accessed November 20, 2013.