

A Sun Protection Survey of New England Fishermen

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Skin cancer is the most common form of cancer in the United States, with more than 1 million cases of nonmelanoma skin cancer diagnosed annually and an estimated 53,600 cases of melanoma and 7400 deaths expected during the year 2002. Excess exposure to UV radiation has long been linked to both melanoma and non-melanoma skin cancers. Fishing is a popular sport in the United States, and one with excessive sun exposure. Results of a survey of recreational fishermen conducted at the 23rd Annual Eastern Fishing & Outdoor Exposition found that sun protection attitudes and practices were poor or inadequate. I recommend that a tailored sun protection intervention program should take into account age, gender, and skin type, as well as the unique obstacles faced by fishermen.

Skin cancer is the most common form of cancer in the United States, with more than 1 million cases of nonmelanoma skin cancer diagnosed annually and an estimated 53,600 cases of melanoma and approximately 7400 deaths expected during the year 2002.¹ Excess exposure to UV radiation has long been linked to both melanoma and nonmelanoma skin cancers. Biological evidence indicates that DNA damaged by UV exposure results in increasing rates of melanoma, basal cell carcinoma (BCC), and squamous cell carcinoma (SCC), as seen in patients with xeroderma pigmentosum, a cluster of diseases marked by an inability of DNA damaged by UV radiation to self-repair.²⁻⁴ Epidemiologic evidence also indicates a causal relationship between sun exposure and melanoma, BCC, and SCC.^{3,5,6} Acute sun exposure is associated with melanoma, while chronic sun exposure is associated

with nonmelanoma skin cancer.⁷⁻⁹ Melanoma occurs more frequently in office workers (whose outdoor exposure most often occurs during weekends and vacations) than in outdoor workers.^{8,10-13}

Fishing is a popular water sport in the United States, exposing fishermen to a double dose of UV light directly from the sun and the reflection off the water. A search of the literature found one study on the sun exposure habits of recreational fishermen, reporting a higher incidence of melanoma in fishermen and boaters combined.⁸ Participation in outdoor water sports was associated with an increased risk of melanoma for fair-skinned individuals in one study in the Netherlands⁹ and an increased risk of BCC in another study in southern Europe.¹⁴ The greatest number of sunburns was found in New Zealanders participating in outdoor sports, including activities on the water, with 38% wearing a hat and 32% applying sunscreen.¹⁵ One study in Switzerland found an association between outdoor sports and an increased risk of BCC.¹⁶

Methods

The Eastern Fishing & Outdoor Exposition is an annual event held in Worcester, Massachusetts, that reaches the largest audience of fishermen in New England, including a diversity of freshwater and saltwater spincasters and fly fishermen (John Lynch, Eastern Fishing & Outdoor Exposition, Inc., oral communication, February 2000). The 23rd Annual Eastern Fishing & Outdoor Exposition in February 2000 attracted approximately 17,000 fishermen from New England and New York (John Lynch, Eastern Fishing & Outdoor Exposition, Inc., oral communication, February 2000). A convenience sample of fishermen were recruited from a survey booth located near the main exit during the 4-day exposition. To attract fishermen, a popular name-brand graphite fishing rod was offered as a raffle prize to participants who completed the survey. Refreshments were served as an added incentive.

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Table 1.

Sun Protection Attitudes

	Agree or Strongly Agree, %	Neutral, %	Disagree or Strongly Disagree, %
Okay to get a sunburn	8.5	15.0	76.5
Sun protection is important	84.4	10.7	4.9
Okay to risk skin damage for a tan	18.5	18.7	62.8
Sunscreen is too much of a hassle	15.1	18.1	66.8
A hat is too much of a hassle	9.9	8.9	81.2
A shirt with sleeves is too much of a hassle	17.7	17.3	65.0
Difficult to stay in the shade	59.3	21.1	19.6

The recreational fishermen survey included 14 questions on sun protection attitudes and practices while fishing. Questions about sun protection attitudes were designed to determine whether fishermen believe sunburns are harmful, whether skin protection is important, and whether they are willing to risk skin damage for the sake of a tan. To determine attitudes toward sun protection practices, questions concerning sunscreen application, wearing a hat, wearing a shirt with sleeves, and staying in the shade were included.

Questions about sun protection practices while fishing included duration of a typical day of fishing, strength of sunscreen applied, if any, and parts of the body exposed without sun protection. Fishermen also were asked to describe the typical sun protection gear worn while fishing, such as hats, shirts, and sunglasses, as well as the frequency with which fishermen stayed in the shade.

Additional information was obtained on demographic characteristics and skin cancer risk factors, including gender, age, education, skin type, natural hair color, and history of skin cancer, as well as the number of days spent fishing that year.

The criteria for eligibility included an age of 18 years or older, a history of fishing within the preceding 12 months, and completion of more than 75% of the survey.

Results

A total of 787 recreational fishermen survey forms were distributed at the exposition. A total of

726 survey forms were returned. Of those, 10 forms were less than 75% completed, 3 respondents were younger than 18 years, and 1 respondent had not fished within the past 12 months. The final response rate was 90.5% (712/787). The results were calculated using SAS Institute statistical software.¹⁷

The survey respondents consisted of a 7:1 ratio of men and women, with subjects ranging in age from 18 to 78 years (median, 44 years). More than a quarter of the respondents (26.5%) had completed some high school or graduated from high school, 32.3% had completed some college, 40.3% had graduated from a 4-year college, and 1.0% described their highest education level as other. Almost three quarters of respondents (73.7%) resided in Massachusetts.

Risk factors for skin cancer include skin type, hair color, and a history of skin cancer. Skin type was determined by the Fitzpatrick typology.¹⁸ Less than a quarter of respondents (24.2%) reported a skin type that always or usually burns; almost half (49.6%) reported a skin type that sometimes burns; and more than a quarter (26.2%) reported a skin type that rarely burns. Natural hair color was divided between those with light-colored hair (red, blond, or light brown; 52.8%) and those with dark hair (dark brown or black; 47.2%). Approximately 5% of those surveyed had a history of skin cancer.

In the 12 months preceding the survey, less than half of the fishermen (48.7%) reported fishing more than 25 days; 21.8% reported between 16 and 25 days; and 29.5% reported 15 days or less. The number of hours per day that respondents typically

Table 2.

Sun Protection Practices*

Type of Protection	Response	% of Responders
Sunscreen	None	25.8
	SPF <15	10.1
	SPF ≥15	64.2
Hat	Baseball cap	71.2
	Broad-brimmed hat	18.0
	None	8.4
	Other	2.4
Shirt	Long sleeves	4.8
	Short sleeves	64.6
	No sleeves	27.8
	None	2.8
Sunglasses	Yes	86.8
	No	10.4
	Other	2.8
Shade	Never/rarely	38.9
	Sometimes	50.0
	Usually/always	11.1

*SPF indicates sun protection factor.

spent fishing was distributed among 0 to 4 hours (32.6%), 4 to 6 hours (37.8%), and more than 6 hours (29.6%).

The participants' attitudes towards sun protection practices are summarized in Table 1, and their sun protection practices are summarized in Table 2. More than two thirds of respondents applied sunscreen or wore clothing that covered exposed parts of the body, such as the shoulders (81.8%), back (77.2%), neck (70.6%), and stomach (67.4%). The feet (62.8%), ears (53.6%), and lips (28.5%) were less likely to be protected.

The type of hat worn varied with gender. The majority of men (93.6%) wore some type of hat, while only three quarters of women (75.6%) wore any type of hat ($P \leq .001$). Of those who wore a hat, only 7.9% thought it a hassle, while 86.5% did not consider it a hassle, and 5.6% were neutral. Of those who wore a shirt, only 15.9% thought it a hassle, while 68.1% did not consider it a hassle,

and 15.9% were neutral. Of those who usually or always stayed in the shade, only 16.7% thought it a hassle, while 53.9% did not consider it a hassle, and 29.5% were neutral.

Age was divided into quartiles. The youngest age group of fishermen (28.8%) were more likely than the oldest age group (18.6%) to find sunburns acceptable ($P \leq .01$). Those who were least willing to risk skin damage for the sake of a tan were more likely to be in the oldest group of fishermen (30.5%) than in the youngest group (20.2%) ($P \leq .01$). In addition, fishermen who wore a shirt without sleeves or did not wear a shirt were more likely to be in the youngest age group (45.3%) than in the oldest age group (11.3%) ($P \leq .001$).

Attitudes toward the importance of skin protection and the willingness to risk skin damage for the sake of a tan varied according to skin type. Fishermen who reported positive attitudes toward skin protection were more likely to sometimes burn (50.0%) than those who always or usually burned (25.5%) or those who rarely burned (24.5%). Those who were willing to risk skin damage for the sake of a tan were more likely to sometimes burn (55.7%) than those who always or usually burned (16.0%) or those who rarely burned (28.2%) ($P \leq .001$).

Skin type was associated with the application of any sunscreen, as well as sunscreen with a sun protection factor (SPF) of 15 or higher. Those who did not apply sunscreen were more likely to sometimes burn (51.7%), while 30.7% rarely burned, and 17.6% always or usually burned. Those who applied sunscreen with an SPF of 15 or higher were more likely to sometimes burn (48.1%) than those who always or usually burned (30.0%) or those who rarely burned (21.9%) ($P \leq .001$).

Conclusion

Sun protection attitudes and practices of New England fishermen are poor or inadequate. Fishermen are confronted with unique obstacles to sun protection. The sport of fishing requires constant motion and ample space for casting rods that extend to more than 5 feet. A shirt with sleeves can limit the range of motion involved in casting, while overhead shade may interfere with both the fishing rod and fishing line. The fish themselves, while setting an example for fishermen by staying in the shade, may keep fishermen in the sun while casting into the shade. Moreover, sunscreen may leave a film on the fishing line that can be detected by fish and act as a repellent.

The American Academy of Dermatology recommends sun protection methods that include applying sunscreen with an SPF of 15 or higher, wearing a

broad-brimmed hat, wearing a shirt with sleeves, and staying in the shade.¹⁹ Survey results indicate that one quarter of those surveyed do not apply sunscreen, and only one quarter wear a long-sleeved shirt. Although most of the men wear a baseball cap, the ears, neck, and lower part of the face may be exposed; and one quarter of the women do not wear any type of hat. More than one half of those surveyed found it difficult to stay in the shade.

A tailored intervention should promote long-sleeved shirts with extra room about the shoulders and cutaway canopies on boats that would allow room for casting. A tailored intervention also should target younger fishermen with poor attitudes toward sunburns and tanning, who are also less likely to wear a shirt with sleeves or sunglasses, and women, who are less likely to wear a hat. Those with risk factors such as skin types that always or usually burn should be targeted to raise their awareness of the importance of skin protection and the damage caused by tanning, as well as the efficacy of using sunscreen with an SPF of 15 or higher.

A successful sun protection intervention program for fishermen should take into account age, gender, and skin type, as well as the unique obstacles and aids to sun protection for fishermen.

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