Changes in sunburn and tanning attitudes among lifeguards over a summer season

Marieke Hiemstra, MSc,[a] Karen Glanz, PhD, MPH,[b] and Eric Nehl, PhD, MS[c]
Nijmegen, The Netherlands; Philadelphia, Pennsylvania; and Atlanta, Georgia

Background: Skin cancer is one of the most common cancers in the United States. Lifeguards are at increased risk of excessive sun exposure and sunburn.

Objectives: We sought to examine changes in: (1) sunburn frequency over a summer while controlling for sun exposure, sun protection habits, and participation in a skin cancer prevention program; and (2) tanning attitudes while controlling for participation in the program.

Methods: Participants in this study were lifeguards (n = 3014) at swimming pools participating in the Pool Cool program in 2005. Lifeguards completed surveys at the beginning and end of the summer. Sequential regression analyses were used to assess changes in sunburn frequency and tanning attitudes.

Results: Sunburn frequency decreased between baseline and follow-up. Having a sunburn over the summer was significantly predicted by baseline sunburn history, ethnicity, skin cancer risk, and sun exposure. The tanning attitude, "People are more attractive if they have a tan," was significantly predicted from baseline tanning attitude and ethnicity. The second tanning attitude, "It helps to have a good base suntan," was significantly predicted by baseline tanning attitude, ethnicity, basic/enhanced group, and moderate skin cancer risk.

Limitations: Self-reported data and limited generalizability to lifeguards at other outdoor pools are limitations.

Conclusion: The findings showed that previous sunburn history is an important predictor of sunburn prospectively. In addition, a more risky tanning attitude is an important predictor of future attitudes toward tanning. Active involvement in targeted prevention programs may help to increase preventive behavior and health risk reduction. (J Am Acad Dermatol 2012;66:430-7.)

Key words: prevention; skin cancer; sun exposure; sun protection habits; sunburn; tanning attitudes.

Skin cancer is the most common form of cancer in the United States[1] and the incidence of skin cancer has increased dramatically since the mid-1950s.[2,3] Annually, more than 1 million cases of nonmelanoma skin cancer and 68,720 cases of melanoma skin cancer are expected to be newly diagnosed.[1] The most important known cause of skin cancer is exposure to ultraviolet radiation from the sun.[4] A history of severe sunburns in childhood and adolescence also lead to increased risk of developing skin cancer.[5]

Although skin cancer is one of the most common cancers, it is also one of the most preventable.[6] Lifelong protection from the sun can prevent most skin cancers.[4] Current recommendations include: avoid the sun during peak hours, use sunscreen with a high sun protection factor, wear protective clothing (hats, shirts, pants) and sunglasses, seek shade when outdoors, and avoid sunburns.[1,5]

With high levels of sun exposure, frequent sunburns, and low levels of sun protection, lifeguards at outdoor swimming pools are at high risk of

From the Behavioural Science Institute, Radboud University Nijmegen[a]; Schools of Medicine and Nursing, University of Pennsylvania[b]; and Rollins School of Public Health, Emory University, Atlanta.[c]

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Reprint requests: Marieke Hiemstra, MSc, Behavioural Science Institute, Radboud University Nijmegen, PO Box 9104, 6500 HE Nijmegen, The Netherlands. E-mail: m.hiemstra@bsi.ru.nl.

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developing skin cancers.[7] Further, adolescents' attitudes toward suntanning often conflict with sun protection recommendations and may lead to risky behaviors.[8] For example, many young people still have positive attitudes toward having a suntan and associate suntans with looking and feeling attractive and healthier.[9]

Prevention programs may be able to help reduce the prevalence of skin cancer through improved preventive behaviors. Outdoor recreation settings can be effective venues for skin cancer prevention activities because of the opportunity to reach people who are frequently exposed to the sun, often for long periods of time (eg, lifeguards). Lifeguards and aquatic instructors can also promote sun protection by serving as positive role models and recommending the use of sun protection to pool goers of all ages.[10,11]

CAPSULE SUMMARY

- In the United States, skin cancer is one of the most common cancers. Lifeguards working at outdoor swimming pools are at increased risk of excessive sunburns.
- This study found that previous sunburn frequency is an important predictor of sunburns prospectively and that a more risky tanning attitude is an important predictor of future attitudes toward tanning.
- Active involvement in targeted prevention programs can help to increase preventive behaviors and health risk reduction.

Therefore, the aims of the current study were to examine changes in: (1) sunburn frequency over a summer while controlling for sun exposure, sun protection habits, and participation in a skin cancer prevention program; and (2) tanning attitudes while controlling for participation in the prevention program.

METHODS

Design and setting

The Pool Cool program is a multicomponent skin cancer prevention program that uses education and environmental strategies to reduce sun exposure and increase sun protection behaviors at outdoor swimming pools. Pool Cool was initially developed and evaluated in a cluster randomized trial in Hawaii and Massachusetts in 1999. The program was found to have significant positive effects on children's sun protection behaviors and on sun safety environments at swimming pools.[12]

After the initial success of the program, a diffusion trial began in 2003 and continued through the summer of 2006. The Pool Cool diffusion trial combined educational and environmental strategies, and tested two strategies (basic vs enhanced) in more than 400 swimming pools throughout the United States. Pools in 32 geographic regions were randomly assigned to basic and enhanced treatment groups. Pools in basic and enhanced groups received a tool kit, training session, and a gallon pump container of sunscreen. The enhanced group pools also received additional sun safety items and environmental supports, including a set of sun signs, and an opportunity to accumulate incentive "points" toward recognition levels (bronze, silver, and gold "Frequent Applier Awards") for implementing various components of the program.[13] The Pool Cool diffusion trial continued for 4 summers and included pool managers, lifeguards, parents, and children aged 5 to 10 years taking swimming lessons at participating outdoor swimming pools.[13]

The Pool Cool skin cancer prevention program teaches children about the dangers of overexposure to the sun and encourages them to develop healthy habits for a lifetime. Lifeguards at the participating swimming pools took part in and delivered the program as part of their usual job duties. They received training about skin cancer prevention and the program, conducted Pool Cool educational lessons as part of swimming lessons, carried out poolside activities, and helped to implement related environmental and policy changes. Parents of children aged 5 to 10 years old taking swimming lessons (or other caretakers accompanying the child to the swimming pool) also were exposed to the Pool Cool swimming lessons, poolside activities, and signs, and completed surveys for the study. The program does not include a specific focus on changing tanning attitudes.

Lifeguards completed baseline surveys before the first Pool Cool training session and follow-up surveys at the end of the summer season. Data from the summer of 2005 were used for this analysis.

Measures

Measures for questionnaire items were selected or adapted from previous surveys on this topic that have been published in the literature.[12,14,15]

Demographic characteristics measured at baseline included age, gender, ethnicity, and education.

Sunburn frequency was assessed by asking how many times (0 to 5 or more) participants were sunburned last summer (baseline) and this summer (follow-up). Sunburn frequency was recoded to none, one, or two or more sunburns during the summer.

Tanning attitudes were assessed at baseline and follow-up with two items assessing different dimensions of tanning attitudes. The first item, "People are more attractive if they have a tan" was measured on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). The second item, "It helps to have a good base suntan" was measured on a 4-point scale from 1 (not at all) to 4 (a great deal).

Skin cancer risk was measured at baseline with an index based on questions about skin color, hair color, eye color, ability to burn or tan, history of sunburn, and skin cancer history. Risk scores were categorized as low, moderate, or high based on previous established scoring systems.[15,16]

Sun exposure was measured at baseline and follow-up by asking the number of hours per day the respondent was in the sun from 10 AM to 4 PM on weekdays, and on weekends. A summary indicator of average daily sun exposure in hours was created by multiplying weekday hours by 5, weekend hours by 2, and dividing by 7 (α = .74).

Sun protection habits were measured at baseline and follow-up with questions about the frequency of practicing 5 sun protective behaviors when outdoors in the sun: wear a shirt with sleeves, wear sunglasses, stay in the shade or under a beach umbrella, wear sunscreen, and wear a hat. Items were scored on 4-point scales from 1 (rarely/never) to 4 (always). The total of the 5 items was divided to create an average score (α = .59).

Pool Cool program participation was assessed at follow-up using 5 sets of questions that measured the lifeguards' involvement as part of their pool's implementation of the program during the summer. Four questions asked about pool policies (6 items), Pool Cool activities (5 items), Pool Cool lessons (3 items), and receipt of Pool Cool items (7 items). One question asked: "How many times in total did you teach the Pool Cool sun safety lessons to children?" A summary score was calculated with a range of 0 to 14 (α = .84). Higher scores on the index of Pool Cool program participation indicated more involvement in and exposure to the Pool Cool program.

Statistical analysis

Analyses were conducted using software (SPSS 15.0, SPSS Inc, Chicago, IL). A total of 3364 lifeguards completed baseline and follow-up surveys in 2005. Participants who answered less than half of the survey questions were excluded from the analysis. After these exclusions, baseline and follow-up surveys were matched based on unique identification numbers, resulting in a final data set of 3014 lifeguards (89.6% of total respondents): 1573 basic and 1441 enhanced respondents.

Descriptive analyses were conducted to describe distributions for the variables of interest. For comparisons of baseline characteristics, between the basic and enhanced groups, χ^2 analyses for categorical variables and t tests for continuous variables were used. Further, to examine the difference between baseline and follow-up in sunburns, tanning attitudes, sun exposure, and sun protection habits, paired sample t tests were used.

The main analyses were conducted in two phases. First, bivariate analyses for the tanning attitudes and sunburn were used to investigate whether demographic and background characteristics were associated (ie, age, gender, ethnicity, education, basic/enhanced group, and skin cancer risk) with sunburns and tanning attitudes at follow-up. Significant covariates ($P < .05$) from the bivariate analysis were retained and included in the main analyses. Significant covariates for sunburns at follow-up were age, ethnicity, basic/enhanced group, and skin cancer risk. For the first tanning attitude, "People are more attractive if they have a tan," at follow-up, ethnicity and basic/enhanced group and for the second tanning attitude, "It helps to have a good base tan," at follow-up, ethnicity, basic/enhanced group, and skin cancer risk were found to be statistically significant.

Second, to address the study aims, sequential multiple regressions were used to examine changes in sunburns and tanning attitudes over the summer. For sunburn, step 1 included age, gender, education level, and sunburns at baseline. In step 2, skin cancer risk was added (light skin cancer risk level was the reference group in the analyses). In step 3, sun exposure, sun protection habits, and Pool Cool program participation were added.

For the first tanning attitude "People are more attractive," step 1 included ethnicity, basic/enhanced group, and the baseline value for this attitude. In step 2, Pool Cool program participation was included. For the second tanning attitude, "It helps to have a good base tan," step 1 included the baseline value for this statement, ethnicity and basic/enhanced group. In step 2, skin cancer risk was added, and in step 3, Pool Cool program participation was added.

Lifeguards from the same swimming pools are likely to share common attitudes and behaviors (ie, clustering), potentially violating the statistical assumption of independence of measures. Therefore, intraclass correlations were calculated to determine the effects of pool clustering. The intraclass correlation coefficient for sunburn was .057, indicating that 5.7% of the variance could be explained by a pool

effect. For the tanning attitude items, the intraclass correlation coefficients were .034 and .016. Because of this small amount of clustering, a decision was made that the subsequent analyses could be done without adjustment.

RESULTS

Descriptive statistics

Sample characteristics. The majority of respondents (84.3%) were Caucasian and female (59.6%) with an average age of 18.61 years old (SD = 4.66). Slightly over one-third (34.4%) had completed some college, 17.5% completed high school, and 43.6% had not finished high school. As can be seen in Table I, there were statistically significant differences between Pool Cool intervention groups for age [t (2337) = 4.17, $P < .001$] and education [t (2982) = −3.20, $P < .05$].

Participants reported zero or one sunburn more often at follow-up than at baseline (none: 19.5%-24.7% and one: 29.3%-32.2%) and the proportion reporting two or more sunburns was lower at follow-up than at baseline (51.2%-43.2%). Reports of sunburns decreased significantly between baseline and follow-up [t (2969) = −8.80, $P < .001$] (Table II). For the first tanning attitude "People are more attractive if they have a tan," the most common answers at follow-up were neutral (27.8%) and agree (46.7%). Scores for this question increased from 3.64 (SD = .91) at baseline to 3.72 (SD = .90) at follow-up [t (3019) = −4.27, $P < .001$]. For the second tanning attitude, "It helps to have a good base tan," the most common answers at follow-up were a little (19.1%) and somewhat (39.7%). Scores significantly increased from 2.85 (SD = .96) at baseline to 2.96 (SD = .93) at follow-up [t (2994) = −5.629, $P < .001$]. Reports of sun exposure significantly increased from 4.37 hours a day (SD = 1.31) at baseline to 4.56 hours a day (SD = 1.26) at follow-up [t (2946) = −7.66, $P < .001$]. Sun protection habits increased from 2.49 (SD = .56) at baseline to 2.61 (SD = .57) at follow-up [t (2947) = −11.83, $P < .001$].

Table I. Baseline characteristics of lifeguards

	Total (n = 3014)		Basic (n = 1573)		Enhanced (n = 1441)	
Characteristic	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age, y	18.6	4.7	18.2	3.2	18.9	5.0
			Percent			
Female gender	59.6		59.5		59.7	
Caucasian ethnicity	84.3		83.1		85.7	
Skin cancer risk level						
Low	31.3		32.4		30.2	
Moderate	34.1		33.6		34.7	
High	34.6		34.1		35.1	
Education						
Did not complete high school	43.6		46.0		41.0	
Completed high school	17.5		17.7		17.2	
Completed some college	34.4		32.4		36.5	

Significant differences in demographic characteristics were found between basic and enhanced groups for age [t (2337) = 4.17, $P < .001$] and education [t (2982) = −3.20, $P < .05$].

Sunburn

We tested the associations between demographics, sunburn history at baseline, sun exposure, sun protection habits, and participation in Pool Cool program and follow-up sunburns (Table III). In step 1, age, gender, education level, and sunburn history at baseline were entered. There was a significant relationship between sunburn history at baseline and sunburns at follow-up ($\beta = .41$, $P < .001$), showing that lifeguards with a history of more sunburns at baseline were more likely to have sunburns at follow-up. We also found that adolescents with ethnicities other than Caucasian were less likely to report a sunburn at follow-up than were Caucasian lifeguards ($\beta = -.11$, $P < .001$). In step 2, skin cancer risk was entered. For sunburn history at baseline ($\beta = .39$, $P < .001$) and ethnicity ($\beta = -.07$, $P < .05$) we still found a significant association with sunburn at follow-up. We also found that lifeguards with high skin cancer risk ($\beta = .13$, $P < .001$) were at increasing risk to get sunburns. In step 3, we entered sun exposure, sun protection habits, and Pool Cool program participation. For sunburn history at baseline ($\beta = .38$, $P < .001$), ethnicity ($\beta = -.07$, $P = .01$), and high skin cancer risk ($\beta = .13$, $P < .001$) we still found a significant effect on sunburn at follow-up. We also found that lifeguards with moderate skin cancer risk were at increased risk of having sunburns at follow-up compared with those with lower risk ($\beta = .05$, $P = .04$). Sun exposure was also a risk factor: 1 hour more of sun exposure daily ($\beta = .05$, $P = .02$) increased the risk of sunburns at follow-up. The variables sunburn at baseline, sun protection habits, sun exposure, and program participation explained 21.8% of the variance in sunburn at follow-up.

Tanning attitudes

Table IV shows the results of sequential regression analyses of responses to the statement "People are more attractive if they have a tan" at follow-up. In step 1, "People are more attractive if they have a tan" at baseline, ethnicity, and group were entered. We found a significant relationship between "People are more attractive if they have a tan" at baseline and

Table II. Mean (SD) for dependent and independent variables for total group and basic and enhanced group

	Total (n = 3014)		Basic (n = 1573)		Enhanced (n = 1441)		
Variable	**Baseline**	**Follow-up**	**Baseline**	**Follow-up**	**Baseline**	**Follow-up**	***t* Test***
Sunburn (range 0-2)	1.32 (.78)	1.19 (.80)	1.31 (.78)	1.20 (.80)	1.32 (.78)	1.16 (.80)	t (2969) = −8.800, $P < .001$
Tanning attitude							
People are more attractive if they have a tan (range 1-5)	3.64 (.91)	3.71 (.90)	3.61 (.91)	3.70 (.92)	3.68 (.91)	3.73 (.89)	t (3019) = −4.27, $P < .001$
It helps to have a good base tan (range 1-4)	2.85 (.96)	2.96 (.93)	2.87 (.95)	2.99 (.92)	2.83 (.97)	2.92 (.94)	t (2994) = −5.629, $P < .001$
Sun exposure	4.37 (1.31)	4.56 (1.26)	4.37 (1.30)	4.62 (1.24)	4.38 (1.31)	4.51 (1.28)	t (2946) = −7.66, $P < .001$
Sun protection habits (range 1-4)	2.49 (.56)	2.61 (.57)	2.52 (.56)	2.63 (.58)	2.47 (.56)	2.60 (.57)	t (2947) = −11.83, $P < .001$
Pool Cool program participation (range 0-14)	—	7.52 (3.31)	—	7.06 (3.33)	—	8.03 (3.22)	

*t Tests were computed for differences between baseline and follow-up values for total population.

"People are more attractive if they have a tan" at follow-up (β = .47, $P < .001$), showing that lifeguards with higher tanning attitudes at baseline were more likely to have higher tanning attitudes at follow-up. Respondents identified as ethnicities other than Caucasian more often disagreed (β = −.08, $P <$ .001) with the statement "People are more attractive if they have a tan" at follow-up, compared with the Caucasian respondents. In step 2, Pool Cool participation was entered. No significant relationship between Pool Cool participation and "People are more attractive if they have a tan" at follow-up was found. "People are more attractive if they have a tan" at baseline (β = .47, $P < .001$) and ethnicity (β = −.08, $P < .001$) were still significant. The independent variables together almost explain a quarter of the variance in "People are more attractive if they have a tan" at follow-up (R^2 = .24).

For the tanning attitude "It helps to have a good base tan," multiple regression analyses found in step 1 a significant relationship between "It helps to have a good base tan" at baseline (β = .41, $P < .001$) and basic/enhanced group (β = −.04, P = .02) on "It helps to have a good base tan" at follow-up (Table V). This means that lifeguards with a higher tanning attitude at baseline were more likely to have a higher tanning attitude at follow-up. The enhanced group disagreed more with the statement "It helps to have a good base tan" at follow-up than the basic group. In step 2, skin cancer risk was entered. We found a significant relationship among "It helps to have a good base tan" at baseline, ethnicity, basic/enhanced group, and moderate skin cancer risk. For ethnicity, respondents identified as not Caucasian disagreed more

Table III. Results of sequential regression analyses examining sunburn among lifeguards

	Overall model statistics		
Variable	**B**	**SE**	β
Step 1			
Sunburn-baseline	.43	.02	.41*
Age	−.01	.005	−.03
Ethnicity	−.23	.04	−.11*
Group	−.02	.03	−.01
Step 2			
Sunburn-baseline	.40	.02	.39*
Age	−.01	.01	−.04
Ethnicity	−.16	.05	−.07†
Group	−.02	.03	−.01
Skin cancer risk dummy 1	.08	.04	.05
Skin cancer risk dummy 2	.22	.04	.13*
Step 3			
Sunburn-baseline	.40	.02	.38*
Age	−.004	.01	−.02
Ethnicity	−.15	.05	−.07†
Group	−.01	.03	−.01
Skin cancer risk dummy 1	.08	.04	.05‡
Skin cancer risk dummy 2	.23	.04	.13*
Sun exposure	.03	.01	.05‡
Sun protection habits	−.03	.03	−.02
Pool Cool program participation	−.01	.01	−.02

Group: 0 = basic and 1 = enhanced.
Ethnicity: 0 = Caucasian and 1 = other.
R^2 = .21 for step 1, R^2 = .22 for steps 2 and 3.
*$P < .001$.
†$P < .01$.
‡$P < .05$.

Table IV. Results of sequential regression analyses examining attitudes about tanning attractiveness among lifeguards

	Overall model statistics		
Variable	**B**	**SE**	β
Step 1			
People are more attractive if they have a tan—baseline	.46	.02	.47*
Ethnicity	−.20	.05	−.08*
Group	−.02	.03	−.01
Step 2			
People are more attractive if they have a tan—baseline	.46	.02	.47*
Ethnicity	−.20	.05	−.08*
Group	−.02	.03	−.01
Pool Cool program participation	−.003	.01	−.01

Group: 0 = basic and 1 = enhanced.
Ethnicity: 0 = Caucasian and 1 = other.
R^2 = .24 for steps 1 and 2.
*$P < .001$.

Table V. Results of sequential regression analyses examining attitudes about base tan among lifeguards

	Overall model statistics		
Variable	**B**	**SE**	β
Step 1			
It helps to have a good base tan—baseline	.39	.02	.41*
Ethnicity	−.08	.05	−.03
Group	−.08	.04	−.04†
Step 2			
It helps to have a good base tan—baseline	.39	.02	.40*
Ethnicity	−.11	.05	−.04†
Group	−.08	.04	−.04†
Skin cancer risk dummy 1	.01	.05	.01
Skin cancer risk dummy 2	−.11	.05	−.06†
Step 3			
It helps to have a good base tan—baseline	.39	.02	.40*
Ethnicity	−.11	.05	−.04†
Group	−.08	.04	−.05†
Skin cancer risk dummy 1	.01	.05	.01
Skin cancer risk dummy 2	−.11	.05	−.06†
Pool Cool program participation	.001	.01	.01

Group: 0 = basic and 1 = enhanced.
Ethnicity: 0 = Caucasian and 1 = other.
R^2 = . 17 for steps 1, 2, and 3.
*$P < .001$.
†$P < .05$.

($\beta = -.04$, $P = .04$) with the statement "It helps to have a good base tan" at follow-up than did Caucasian respondents. For skin cancer risk, respondents with moderate skin cancer risk disagreed more with the statement "It helps to have a good base tan" ($\beta = -.06$, $P = .02$) compared with respondents with a low skin cancer risk. In step 3, Pool Cool participation was entered. No significant relationship between Pool Cool participation and "It helps to have a good base tan" was found at follow-up. "It helps to have a good base tan" at baseline ($\beta = .40$, $P < .001$), ethnicity ($\beta = -.04$, $P = .04$), group ($\beta = -.05$, $P = .02$), and moderate skin cancer risk ($\beta = -.06$, $P = .02$) were still significant. The independent variables explain 17.4% of the variance in responses to the statement "It helps to have a good base tan" at follow-up.

DISCUSSION

The main aim of this study was to examine the change in sunburn frequency among lifeguards over a summer, while controlling for sun exposure, sun protection habits, and participation in a skin cancer prevention program, and to examine the change in tanning attitudes over time while controlling for participation in the prevention program.

Findings revealed that important predictors of future sunburns are previous sunburns, ethnicity, higher skin cancer risk, and more sun exposure. Previous research has found comparable results. For ethnicity, research from the Centers for Disease Control and Prevention[17] found that non-Hispanic Caucasians and American Indians/Alaska Natives had the highest proportion of respondents stating they had 4 or more sunburns during the preceding year (21.2% and 19.6%, respectively). Our finding that previous sunburning predicts future sunburns suggests that a subgroup of lifeguards with a history of sunburn should receive special attention in prevention programs.

Findings also showed that over a summer, the amount of sunburn in the entire population of lifeguards decreased. Specifically, the amount of sunburns over a summer decreased: two or more sunburns decreased and one or zero sunburns increased. This could be based on the fact that sun protection habits improved between baseline and follow-up. Most likely, lifeguards were more vigilant protecting themselves from the sun as the summer progressed.

With respect to tanning attitudes (ie, "People are more attractive if they have a tan" and "It helps to have a good base tan"), we found that previous tanning attitude is a significant predictor of future tanning attitudes. Another important predictor of "People are more attractive if they have a tan" follow-up is ethnicity. We found that ethnicity, skin

cancer risk, and group are predictors of "It helps to have a good base tan." We found no previous publications reporting on the relationship between tanning attitude and ethnicity.

We found that attitudes about tanning attractiveness and the desirability of a base tan were significantly increased at follow-up. An explanation for this may be that, at the end of the summer, lifeguards think that they need to have a tan because of the beliefs and expectations of their parents and friends. At the beginning of the summer this might have lesser influence.[18]

Limitations and recommendations

There are some limitations of this study. First, the study data were collected by self-report. Limitations include possible misinterpretation of the questions by the respondents, inaccurate recall, or misrepresentation of the truth. Respondents may give socially desirable responses or may simply answer erroneously. However, this limitation is mitigated by other findings: in an ancillary study to the Pool Cool diffusion trial, the validity of self-report was tested compared with objective assessments and it was found that self-reported data about sunscreen use and sun protection habits are generally accurate (for example, Glanz et al[19] and O'Riordan et al[20]). Second, the time period used in this research was fairly short. The period between the baseline and follow-up assessments in this analysis was only a summer season, although the lifeguards may have participated in Pool Cool in previous summers. Third, generalizability of the study is limited to lifeguards and aquatic staff working at outdoor pools.

A recommendation based on these findings is that it remains important to conduct longer-term analyses of sunburn and tanning attitudes among lifeguards, to examine change over time, and examine the longer-term effects of prevention programs. It is important to develop an intervention program that is effective in changing attitudes and reducing sunburns among lifeguards. Individual perceptions of personal risk and motivation to change behavior are important factors to focus on. A recommendation for future research to reduce sunburns among lifeguards is to develop a widely disseminated education and behavior change program specifically for them (see Hall et al[11]). This is important because lifeguards, as outdoor workers, are a very high risk group for skin cancer.[21,22]

CONCLUSION

In conclusion, the findings showed that previous sunburns are important predictors of sunburns prospectively. In addition, a more risky tanning attitude is a significant predictor of future attitudes toward tanning. Therefore, active involvement in targeted prevention programs may help to increase preventive behavior and reduce cancer risk among this population that is highly sun exposed because of their occupation as lifeguards.

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