Sun Protection Behaviors Among Latino Migrant Farmworkers in Eastern North Carolina

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Objective: Farmworkers are at an increased risk of skin cancer from exposure to excessive amounts of ultraviolet radiation from the sun. The primary objective of this study was to evaluate sun protection behaviors. **Methods:** A cross-sectional study of Latino farmworkers in eastern North Carolina was conducted using personal interviews followed by a full-body examination for skin cancers ($N = 157$). **Results:** Participants were predominately, young, males from Mexico who spent 9 or more hours each work day in the sun. Most reported wearing long sleeved shirts (85.7%) and long pants (98.0%). Few workers rarely used sunscreen (90.8%) or wore sunglasses (87.4%). Skin cancers were not identified among workers. **Conclusions:** In general, farmworkers lack sufficient information and knowledge about the risks of skin cancer from the sun. Interventions for reducing excessive ultraviolet radiation exposures are warranted.

Farmworkers spend a considerable amount of time working outdoors and are exposed to excessive amounts of ultraviolet radiation (UVR) from the sun, placing them at an increased risk for sunburn and skin cancer.[1–4] Universal accepted guidelines to reduce or avoid UVR exposure when outdoors include the use of protective clothing and sunscreen.[5–8]

Hispanic farmworkers represent a vulnerable workgroup population that faces significant occupational hazards and exposures as part of their daily agricultural duties. Although exposure to UVR from the sun is a major source of exposure, sun safety and knowledge of skin cancer have not been broadly studied among this occupational group. In comparison with sun protection studies among farmers, there is a paucity of published literature that has evaluated sun safety behavior among Hispanic farmworkers.[9] Approximately 35% of farmworkers did not have any knowledge of skin cancer, and 63% did not know if they were at risk for developing skin cancer. As noted by the author, the generalizability of the study was limited to farmworkers in a specific geographic location. Also, the sample was conducted among farmworkers harvesting fruit crops from trees (including nectarines, plums, and pomegranates), which may offer more shade than working in open fields, such as picking sweet potatoes or planting tobacco. In a qualitative study of perception and skin disease among migrant farmworkers ($N = 30$), Arcury et al[10] identified that farmworkers experienced sunburns when working outside, but few were aware of the long-term health effects of excessive sun exposure.

Eastern North Carolina is composed of 29 counties (ENC–29) and ranks among the largest sweet potato and flue-cured tobacco producing region in the United States. It has a high number of Latino farmworkers who work in labor intensive crops, planting, harvesting, and performing other agricultural tasks. The majority of these workers can be characterized as migrant, young males, from Mexico, with H-2A (visa) status and little education. Given the harsh nature of working outdoors, it is important for farmworkers to protect themselves and reduce overexposure to UVR by wearing appropriate clothing, applying sunscreen, and seeking shade to avoid midday sun. It is important to assess behavior and knowledge of this work population to establish a foundation from which interventions can be developed whereby reducing the incidence of sunburn and skin cancer of these largely preventable conditions. The purpose of this project was to evaluate sun protection behavior, knowledge, perception, and behavior among Latino farmworkers in an agriculture setting. In addition, we assess perception of skin cancer and conduct a pre-cancer screening examination.

METHODS

Participants

This was a cross-sectional study among 157 farmworkers over one growing season working in eastern North Carolina. The participants were recruited from migrant labor camps, housing, and barracks chosen by Green County Health Care, Inc (GCHC) outreach workers. After obtaining permission from the farm owner or farm manager, a convenience sample was conducted among farmworkers at five different migrant labor camps. To be eligible, participants had to speak Spanish or English, 18 years or older, and consent to participate in the study. A total of 159 workers were approached and asked to participate. Two farmworkers did not meet the eligibility criteria and were not included in the study ($N = 157$). This study was approved by the University and Medical Center Institutional Review Board at East Carolina University (UMCIRB 13–000819) prior to any data collection.

Procedures

Most participants completed an interview questionnaire followed by a full-body physical examination for skin cancer. The investigators compiled a questionnaire that was critically reviewed by other professionals serving the farmworker community and revised on the basis of comments received. Specific survey items were taken from existing sun safety survey instruments from Salas et al,[2] as well as from previous questionnaires developed by Kearney et al.[11] It was then translated and back translated to ensure that it accurately reflected the topics being addressed. Then, the survey was field tested with four Latino farmworkers prior to distribution and revised accordingly. The developed questionnaire was distributed to participants by interviewers bilingual in English and Spanish from (GCHC). Interviewers were given a training program directed by investigators. This training program included information about protecting human subjects, obtaining consent, recruitment procedures,

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interview techniques, an overview of the project's goals and design, and a question-by-question review of the interview. Interviewers then completed practice interviews while being observed by investigators. Primary responsibilities of the interviewers included recruiting participants, explaining the project to potential participants, obtaining oral consent, data collection, interpretation of instructions, and reporting of examination results. Finally, a visual screening examination for skin cancer was conducted by a board certified dermatologist or dermatology resident. Written consent was obtained from each participant prior to any data collection.

Data Collection

The interviews were conducted in migrant labor camps, housing, and barracks, which were chosen by the GCHC outreach workers. Most participants were approached in random order at the end of a typical workday and asked to participate in the study by interviewers. The interviews took approximately 15 minutes to complete and were conducted in private so that the participants could understand the questions and give confidential answers. At the end of the interview, the participants were given the opportunity to receive a physical skin cancer screening examination. Screenings for full-body examinations were held in a private room and were conducted by a board certified dermatologist and medical resident at the East Carolina University, Brody School of Medicine. A full-body diagram, including face, ears, and hands, was developed and used to record presumptive diagnosis of skin conditions. In the event a skin cancer was detected or suspected by the physician (or resident), examiners provided oral and written instructions for seeking treatment at the local clinic. Upon completion of the questionnaire and body exam, farmworker participants were provided with information on skin cancer self-examinations and sun safety. The screenings took approximately 5 to 7 minutes. Afterwards, participants received a $10 gift card, sunscreen, and instructions on skin cancer self-examinations and sun safety.

Measures

The primary measures for this analysis included personal characteristics, knowledge, perceptions, work environment, access to safety information, and sun protection behavior. Personal variables included age, sex, race/ethnicity, education, marital status, H-2A visa, health insurance status, time worked in the United States, months worked per year, hours worked per day, and primary crops worked in over the past 12 months. Measures of skin type included a number of sunburns this growing season, burn easily in the sun, ability to tan, eye color, and skin color/sun sensitivity.[12] Additional variables included "yes/no responses" of family history of skin cancer and personal interest to learning more about skin cancer.

Knowledge of protecting skin from the sun was assessed using a Likert-type scale (nothing to very little knowledge = 1, somewhat knowledgeable = 2, and knowledgeable to very knowledgeable = 3). Additional questions including, knowledge of what sun block was used for, ever heard of skin cancer, and knowing signs and symptoms of skin cancer were assessed using yes/no responses. Perceptions of risks associated with getting skin cancer, sun safety and availability of sun safety information and concerns about working in hot conditions, working with pesticides, and wearing personal protection when workings with pesticides were also assessed using yes/no responses. Sun safety behavior responses were based on a Likert-type scale (never = 1, rarely = 2, sometimes = 3, often = 4, and always = 5) when asked when working in the sun for more than 15 minutes how often do you wear the following: long pants, something on your head (any type of hat, cap, or visor), long sleeved shirt or blouse, gloves, wide brim hat with surrounding brim (more than 2.5 inches), protective gear over face (eg, handkerchief, bandana, or mask) sun glasses and sunscreen with sun protection factor 15 or higher. To be more specific, the style/type of hat worn most often when working outside, baseball cap, wide brim with 2.5 inches or greater, brimmed hat (with less than 2.5 inch surrounding brim), sombrero, or other, was asked. Yes/no responses were recorded for where sunscreen is most often used (face, neck, ears, arms, hands, and legs). For the dermatologic skin examination, the presence (or absence) of signs or indications of seborrheic keratosis, actinic keratosis, basal cell carcinoma, squamous cell carcinoma, melanoma, or other skin condition was recorded as dichotomous measures (yes/no).

Data Analysis

All analyses of the data collected from interviews, as well as from the screenings, were performed using the Statistical Package for the Social Sciences (IBM SPSS, Chicago, IL) software (v. 20). For continuous measures (scales), means and standard deviations were used to describe their distributions. Differences in occupational characteristics, health characteristics, occupational safety training, risk perceptions, and behaviors by personal characteristics were examined with crosstabs and tested with the chi-square test or the Fischer exact as appropriate, P values less than or equal to 0.05 were considered statistically significant.

RESULTS

Personal and Work Characteristics

As shown in Table 1, the majority of farmworker participants ($N = 157$) were between 31 and 45 years (mean = 36.0), male (100.0%), Mexican origin (91.5%), eighth grade or less education (44.2%), married (76.0%), and had non-H-2A visa status (61%). Most participants reported not having health insurance (94.0%), worked in the United States more than 3 years (76.1%), worked between 5 and 8 months out of the year (70.3%), worked 9 or more hours per day (87.1%), and worked primarily in tobacco (75.3%) and/or sweet potatoes (23.4%) in the past 12 months.

When describing personal characteristics related to skin and skin cancer, 15.1% of farmworkers reported having between one and three sunburns over the past growing season, 85.0% rarely burned in the sun, and most had brown eyes (79.2%) and light brown skin (46.8%). More than 98% had never had a diagnosis of skin cancer, 92.1% had no family history of skin cancer, and 36.6% were interested in learning more about skin cancer.

Knowledge of Skin Cancer

More than three quarters (83.8%) of participants reported having none to very little knowledge about protecting their skin from the sun (Table 2). Approximately half (49.0%) of participants reported knowing what suncream (block) was used for, and 77.9% had heard of skin cancer. Nearly all participants (92.2%) did not know about physical signs or symptoms of skin cancer, and 77.0% did not perceive themselves at risk. Sixty-three percent of farmworkers reported never having received any information about sun safety, and 67.2% said they would get sun safety information from their supervisor and that it was available at work. More than 57% reported working with pesticides, and among those who responded 26.1% reported wearing personal protective equipment when working with pesticides.

Sun Safety Behavior

As shown in Table 3, when asked about personal sun protection when working in the sun for 15 minutes or longer during the summer, the majority of farmworkers reported wearing long pants (98.0%), some type of sun protection (including hat, cap, or visor) on the head (93.5%), long sleeved shirt (85.7%), shirt with a collar (79.2%), and gloves (56.7%). Personal sun safety behavior that was never or rarely worn included a wide brim hat (71.2%) or protective gear over face, such as a handkerchief, bandana, or mask (83.0%). Sunglasses (11.3%) and sunscreen (9.2%) were the least

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TABLE 1. Personal and Work Characteristics ($N = 127$)

Age, [mean] (SD)	36 [43] (10.5)
18–30 yrs	54 (35.1%)
31–45 yrs	78 (50.6%)
46 or more yrs	22 (14.0%)
Sex	
Male	157 (100.0%)
Race and ethnicity	
Mexican	144 (91.5%)
Mexican American	7 (4.5%)
White (non-Hispanic)	1 (0.6%)
Other	2 (1.3%)
Educational attainment	
8th grade or less	68 (44.2%)
9th–11th grade	54 (35.1%)
High school diploma or GED	18 (11.7%)
Trade school or college	14 (9.0%)
Marital status	
Singe	34 (22.1%)
Married	118 (76.0%)
Separated/divorced	3 (1.9%)
H-2A visa status	
Non-H-2A	96 (61.1%)
H-2A	61 (38.9%)
Health insurance status	
Does not have insurance	142 (94.0%)
Has health insurance	9 (6.0%)
Last visit to doctor	
Less than 12 mo ago	10 (7.9%)
Between 1 and 3 yrs ago	22 (17.3%)
More than 3 yrs ago or never	95 (74.8%)
Amount of time worked in the United States	
Less than 1 yr	14 (9.0%)
Between 1 and 3 yrs	23 (14.8%)
More than 3 yrs	118 (76.1%)
Months worked per year	
4 mo or less	11 (7.5%)
Between 5 and 8 mo	103 (70.3%)
Between 9 and 12 mo	33 (21.0%)
Hours worked in sun per day	
0–5 h	3 (1.9%)
6–8 h	16 (10.4%)
9 h or more	135 (87.1%)
Primary crops over past 12 mo	
Tobacco	116 (75.3%)
Sweet potato	36 (23.4%)
Other	19 (12.6%)
Number of sunburns this growing season	
No sunburns	127 (83.6%)
1–3 sunburns	23 (15.1%)
4–6 sunburns	2 (1.3%)
Skin's response to first exposure to summer sun, without sunscreen, for one-half hour, at midday	
Always burn, unable to tan	2 (1.3%)
Usually burn, then tan	4 (2.6%)
Sometimes mild burn, then tan easily	17 (11.1%)
Rarely burn, tan easily	130 (85.0%)
Eye color	
Brown	122 (79.2%)
Green/hazel	21 (13.6%)
Blue	1 (0.6%)
Gray	2 (1.3%)
Other	8 (5.2%)
Untanned skin color	
White (type I)	18 (11.5%)
Olive/dark white (type II)	27 (17.5%)
Light brown (type III)	72 (46.8%)
Dark brown (type IV)	37 (24.0%)
Previous diagnosis of skin cancer	
No	151 (98.7%)
Yes	2 (1.3%)
Previous family diagnosis of skin cancer	
No	140 (92.1%)
Yes	12 (7.9%)
Have you ever received information regarding sun safety?	
No	85 (63.4%)
Yes	49 (36.6%)

Not all categories sum to 157 as not all respondents answered each question. Percentages and descriptive statistics are based on the number of respondents who answered the given question.

Adapted from Fitzpatrick.[12]

GED, General Education Development.

likely methods used for sun protection. When asked *where do you use sunscreen*, the majority reported on the face (6.5%), and the least was the legs (1.0%). Overwhelmingly, the majority of participants reported wearing baseball caps (68.4%), followed by a wide brim hat (21.7%), brim hat with less than 2.5 inch surrounding brim (4.6%), sombrero (3.9%), and other (1.3%).

Skin Examination

Among the sample of those who received pre-cancer examinations 48% ($n = 76/157$), none of the participants presented clinical diagnosis of either actinic keratosis, basal cell, squamous cell, or melanoma. Dermatologic skin observations among the majority of those who were screened ($n = 76$) included scars, bruises (shoulder area), birth marks, and insect bites (32.9%). Other skin conditions noted included seborrheic keratosis (4%), acne (5.3%), and eczema (5.3%).

Exploratory Analysis

In the chi-square analysis, we recoded the behavior variables into dichotomous responses using always/often versus other (never/rarely or half of the time). We also recoded skin types I and II as more susceptible to burning versus those less likely to burn in the sun (types III and IV, respectively) and evaluated associations. Statistical associations identified that farmworkers with darker skin were more likely to spend more time in the sun ($P = 0.015$) than those with lighter skin. Nevertheless, those with lighter skin were more likely to wear a wide brim hat ($P = 0.001$), long sleeved shirt ($P = 0.007$), and shirt with collar ($P = 0.038$). Those reporting working longer hours were more likely to wear a wide brim hat ($P = .001$). When we examined the number of hours in the sun, the number of sunburns, education in multiple categories with knowledge and perceived risk of getting skin cancer, we did not find any statistically significant associations. There were no statistical associations identified between those who received skin cancer

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TABLE 2. Knowledge, Perception, and Access to Information About Skin Cancer and Sun Safety ($N = 157$)

How much would you say you know about protecting skin from sun?	
Nothing to very little	124 (83.8%)
Somewhat knowledgeable	16 (10.8%)
Knowledgeable to very knowledgeable	8 (5.4%)
Do you know what sunblock (or suncream) is used for?	
No	72 (50.3%)
Yes	70 (49.0%)
Ever heard of skin cancer?	
No	34 (22.1%)
Yes	120 (77.9%)
Do you understand the signs and symptoms of skin cancer?	
No	141 (92.2%)
Yes	12 (7.8%)
Do you perceive yourself at risk for getting skin cancer?	
No	117 (77.0%)
Yes	25 (16.4%)
Do not know	10 (6.6%)
Have you ever received information about sun safety?	
No	85 (63.4%)
Yes	49 (36.6.0%)
Where did you receive information about sun safety?	
Foreman/supervisor	45 (67.2%)
Coworker	11 (16.4%)
Outreach worker	8 (5.1%)
Physician	3 (1.9%)
Is information about sun safety available to you?	
No	84 (59.6%)
Yes	57 (36.3%)
Where is sun safety information available to you?	
Work	45 (67.2%)
Home	3 (4.5%)
Clinic	11 (16.4%)
Outreach workers	8 (11.9%)
Do you work with pesticides?	
No	50 (42.4%)
Yes	68 (57.6%)
Do you wear personal protective equipment when working with pesticides	
No	69 (73.9%)
Yes	24 (26.1%)

Not all categories sum to 157 as not all respondents answered each question. Numbers and percentages are based on respondents who answered each question.

screenings and measures of sun protection behavior, knowledge, or other characteristics.

DISCUSSION

Protection from ultraviolet exposure from the sun is the most preventable risk factor for skin cancer.[1,6] The majority of farmworkers we sampled worked considerably long hours (more than 9 hours per day) in primarily in unshaded, open field crop environments that offer the worker little protection from UVR. Given their duration of daily exposure to solar radiation, a large percentage of the farmworkers in our sample seemed to adequately protect most of the upper and lower body area from UVR by wearing long pants, long sleeved shirts, and shirts with a collar. Nevertheless, the use of sunblock, adequate protection for the head, and perception and knowledge of risks associated with skin cancer was low.

Results from this study are relatively consistent with findings from the California farmworker study.[2] Salas et al[2] identified that the most frequently reported sun protection methods among California farmworkers ($n = 326$) included wearing long sleeved shirts (77%), shirts with collars (74%), and *always* wearing some type of hat (99%). Nevertheless, the majority of participants (87%) in the study reported never wearing hats with at least a 2.5-inch brim or larger or wearing sunscreen (97%). Results from our study compared similarly with almost 93% of participants reporting wearing some type of hat, with a large majority wearing baseball caps (68%), long sleeved shirts (86%), and shirts with collars (79%). Although baseball-style caps are a popular style of hat in the United States among agricultural workers, it offers little protection from the sun on the back of neck, ears, lips, and parts of the face. When we showed participants three styles of hats (wide brim, baseball hat with a back flap, and baseball cap) and asked which one they preferred to wear when working outdoors, most preferred the wide brim style hat. Many responded that they wore baseball caps, primarily because, unlike the wide brim hat, the baseball hat did not interfere with their work activities. For example, participants picking/cultivating sweet potatoes by hand noted that the wide brim hat was bothersome when placing and carrying buckets on their shoulders in the fields. Others reported cost and the lack of availability to purchase a wide brim hat. Also, in exploratory analysis, we identified an association between wearing long sleeved shirts and long pants with lighter-skinned farmworkers. Nevertheless, as noted by Salas et al,[2] a large majority of farmworkers, regardless of skin type, reported wearing these items. Therefore, a logical assumption could attribute this to worker *non* sun protection (eg, from insects and chemical residues). Sunscreen use in our study ranked somewhat higher (9%) than the California study (0.3% to 1.5%). Interestingly, 19.3% California farmworkers reported having knowledge of what sunscreen/sunblock was and how it was used compared with 50% in this study. One explanation may be that promotores de salud we were working with reported emphasizing the use of sunblock and skin protection as part of their outreach educational training at migrant camps. Although a large proportion of workers were light skin (that burned easily in the sun), only 15% actually reported having a sunburn within the past year. Regardless, dermatology screenings did not identify any skin cancers among any of the workers; however, photo aging (premature aging of the skin) from repeated sun exposure was observed on the back and front of neck and chest area, from unbuttoned shirt (Fig. 1).

In both, the California study and in this study, sunglasses or protective gear for the eyes were never or rarely worn.[13] Farmworkers spend upward of more than 9 hours a day working, presumably for the most part in daylight hours when ultraviolet rays are the strongest. Long-term ocular sequelae can include cataract, retinal damage, and pterygia formation.[13,14] In a study by Taylor et al[14] among farmworkers in eastern North Carolina ($n = 304$), a crude prevalence of 23.3% for pytergium, in at least one eye, was identified.

Limitations

As a cross-sectional study, there were several design limitations. Although sun safety and health behavior characteristics were identified during a specific point in time, a longitudinal follow-up study, conducted over a number of growing seasons, may have provided differing results. Also, the study was limited by self-reporting bias from the behavior survey. This may have allowed participants to over- or underestimate their personal behavior characteristics. In addition, the surveys were conducted among migrant labor camps in eastern North Carolina and included a relatively small sample size. This limits the generalizability of our results to other farmworkers in other areas. Other limitations included that only 76 ($n = 48.4\%$) of the total participants received a physical skin examination. This was due to a combination of factors. First, our inability to perform screenings quickly enough on all of the workers;

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TABLE 3. Frequency Distribution of Sun Safety Behaviors ($N = 157$)

	Never or Rarely	Half of the Time	Often or Always
When in the sun >15 min during summer, how often do you:			
Wear long pants	3 (1.9%)	—	150 (98.0%)
Wear something on your head (any type of hat, cap, or visor)	10 (6.5%)	—	143 (93.5%)
Wear a long sleeved shirt or blouse	20 (13.0%)	2 (1.3%)	132 (85.7%)
Wear a shirt with a collar	30 (19.5%)	2 (1.3%)	122 (79.2%)
Wear gloves	61 (40.7%)	4 (2.5%)	85 (56.7%)
Wear a wide brim hat with surrounding brim more than 2.5 inches	109 (71.2%)	2 (1.3%)	42 (27.5%)
Wear any protective gear over face (like a handkerchief, bandana, or mask)	127 (83.0%)	2 (1.3%)	24 (15.7%)
Wear sunglasses	132 (87.4%)	2 (1.3%)	17 (11.3%)
Wear sunscreen with SPF 15 or higher	139 (90.8%)	—	14 (9.2%)
	No	**Yes**	
If you wear sunscreen, do you wear it on the following?			
Face	130 (92.9%)	9 (6.5%)	
Neck	132 (95.7%)	6 (4.3%)	
Ears	134 (97.1%)	4 (2.9%)	
Upper arms	131 (95.6%)	6 (3.8%)	
Lower arms	135 (97.8%)	3 (2.2%)	
Hands	135 (97.8%)	3 (2.2%)	
Legs	136 (99.3%)	1 (0.7%)	
		Yes	
*When you wear a hat, what type do you wear most often:			
Baseball cap		104 (68.4%)	
Wide brim hat with 2.5 inch surrounding brim		33 (21.7%)	
Brimmed hat with less than 2.5 inch surrounding brim		7 (4.6%)	
Sombrero		6 (3.9%)	
Other		2 (1.3%)	

Not all categories sum to 157 as not all respondents answered each question. Numbers and percentages are based on respondents who answered each question.

SPF, sun protection factor.

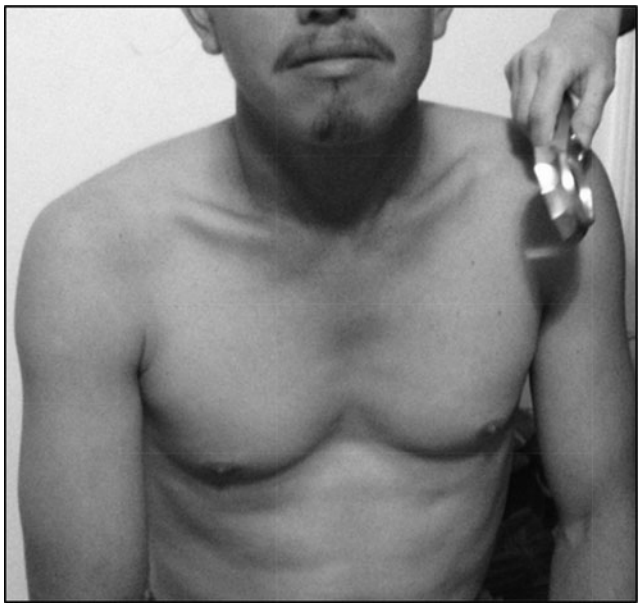

FIGURE 1. Example of UVR exposure to neck and chest area of a farmworker.

second, interviews and screenings were conducted in the evening, after workers had returned back to the labor camps after a long day of working in the field, showered, eaten dinner, and were ready for sleep.

CONCLUSIONS

Given that the majority of participants in the study had brown eyes, dark skin, and had no visual signs of skin cancer, one would believe that farmworkers are at low risk for skin cancer. However, from our sample, we found that nearly one-third of farmworkers we interviewed had lighter skin types with repeated sunburns, placing them at higher risk for skin cancer. Nevertheless, our results identified that nearly 30% of farmworkers we interviewed actually had skin types I and II, placing them at an increased risk for sunburn and skin cancer. Because skin types vary among individuals and the prevalence of skin cancers has never been established among this workgroup population, we were initially quite uncertain of whether we would detect any skin cancers among this workgroup population. Again, we believe that the small sample size and the younger workers may have played a role in the negligible skin cancer screening outcomes. Skin conditions that we identified were common and consistent with other research study findings of skin disorders among farmworkers.[15]

Also worth noting, while whites are considered high risk, every skin type, including dark skin, is at risk for sunburn and skin

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cancer.[16,17] Melanin, darker skin pigmentation, is more protective against UVR than lighter skin; however, research has linked UVR exposure with DNA damage and skin cancer across all skin types.[18–21] From 1992 to 1996, the annual age-adjusted melanoma incidence rate among the U.S. Latino population was 3.7 (per 100,000) compared to 4.9 (per 100,000) from 2001 to 2005, a 32.4% change.[21,22] In the general population, the incidence of melanoma skin cancer has been increasing in the United States among Hispanics, with Latinos experiencing more advanced tumors with a prognosis than non-Latino whites.[23–25] This may partly be because they have less awareness about risk factors or symptoms,[16,26] are more likely to lack health insurance,[27] and are not targeted in melanoma screen effort that may delay in seeking treatment.[28,29] In a report by the Centers for Disease Control and Prevention, the estimated adult sunburn prevalence was 35.6% among non-Latino whites and 45.6% among Latinos in the United States, with both groups almost equally reporting 4 or more sunburns a year.[30] These findings may be explained by low, perceived skin cancer risk among Hispanics that leads to high UVR exposure.[26,27] In addition, the significance of late diagnosis of skin cancer, specifically for melanoma, significantly reduces the chances for survival. The 5-year survival rate for those with early detection of melanoma is high (97%); however, the survival rate can fall considerably with late detection.[7] Although skin cancers were not identified, observed sun damaged markings on back of neck and front chest area indicated repeated sun damage exposure and increased risk of skin cancer. Also, a majority of workers were young, which may help explain that there were no skin cancers identified. Longer latency periods among older farmworkers with excessive UVR duration may be an area to target for future studies and skin examinations. Future studies may include using direct observational methods and sun protection scores for making comparisons between farmworkers and other groups for assessing adequate sun behavior.[31–34]

Farmworkers in this study were considered part of the eastern migrant stream; comparative differences of sun protection behavior in geographical areas including eastern, midwest, and western streams, are future studies worthy of exploring. Skin cancer awareness including education and self-examination are preventive efforts that should be emphasized by health care providers, clinicians, and outreach workers among this vulnerable workgroup population.

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