Title: **Enhancing Collective Efficacy to Encourage Sun Protective Behaviors in Head** **Start Preschool Teachers**

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**Abstract**

This study evaluated two instructional approaches. *Collective efficacy* promoted sun-protective behaviors by using teamwork. *Self-efficacy* promoted sun-protective behaviors by encouraging personal responsibility. We theorized that *Collective efficacy* would have a greater impact on knowledge, attitudes, and would lower sun risk-level scores (behavior), and whether demographics were related to changes in attitudes, knowledge, and sun risk-level (behavior).

 Teachers from San Bernardino County *Head Start* were invited to participate. Twenty-four preschools were randomized into three groups: a *Collective Efficacy Group (CE)*, *Self-Efficacy Group (SE)*, or the *Delayed Control Group (DI)*.A pretest/posttest group design with self-administered questionnaires was used.

 The respondents (*N =* 175) were female (94.9%), married (59%), Hispanic/Mexican American (53%), Black/African American (20%), and (39%) had some college. MANCOVA analysis showed that *CE* and *SE* participants showed significant improvements in sun-risk level (p=.01) and knowledge (*p* = .001). Additionally the *CE* group showed significant improvement in attitudes (*p* = .001). However, there no significant differences found between the *CE* and the *SE* groups when compared to each other. Both intervention types worked equally well.

 Multiple regression analyses examined whether demographics (age, ethnicity, married, education) pretest knowledge scores and Fitzpatric Skin-Type affected knowledge, attitude, and sun risk-level behaviors. Six demographic variables accounted for 36% to 53% of the variance in the models. The analyses showed that Black participants had significantly lower (p = .003) posttest attitude scores. Hispanic participants also showed lower levels of posttest knowledge and attitudes but practiced more sun protective behaviors (p = .004)

**Keywords:** Solar ultra violet radiation, skin cancer, self-efficacy, collective efficacy.

**Introduction**

Melanoma claims nearly 7,300 lives per year (Centers for Disease Control and Prevention [CDC], 2003). The Department of Health and Human Services (DHHS, 2010) declared a causal relationship between unprotected sun exposure and skin cancer (Canadian Centre of Occupational Health and Safety [CCOHS], 2009). Healthy People 2020 Objectives for the Nation (DHHS, 2010) advocates decreasing exposure to sunlight in order to reduce the occurrence of skin cancers. Literature shows that skin cancer can be partially mitigated though personal behavior changes (Glanz, Buller, & Saraiya, 2007).

National health education interventions resulted in a significant drop in the death rate from skin cancer (U.S. Cancer Statistics Working Group, 2010). These campaigns now focus on promoting on-the-job sun-protective behaviors (Task Force on Community Preventive Services, 2004). Occupations that experience chronic exposure to sunlight are construction workers, landscapers, utility installers, postal workers, and meter readers. These occupations place workers at greater risk for skin damage (DHHS, 2009; Girgis, Sanson-Fisher, & Watson, 1994).

 Postal workers (United States) were the focus of a study conducted by Mayer et al, (2006). Results showed that encouragement from co-workers or family members was critical when workers considered wearing sunscreen or a hat for protection during work hours. Shoveller, Lovato, Perters, & Rivers (2000) reported that most employers provided very little practical information about sun safety to their workers and any sun-safe information they received was usually obtained from family, friends, or the media.

 Shani, Rachkovsky, Bahar-Fuches, & Rosenberg (2000) conducted a 24-month post-intervention study of sun-protective behaviors with individuals employed with the Israeli National Water Company. The health “education group” consistently used more sun protection (hats, sunglasses, long-sleeve shirts) compared to the “regulation group”. Also, the “education group” engaged in a form of group empowerment (teamwork) to encourage sun-protective behaviors. Reminders from friends to “fetch” their sun gear (hats) before leaving the office attributed to the higher number of persons practicing sun protection in this group.

 Glanz, et al, (2007) performed a review of occupationally-based interventions which promoted sun-protective behaviors in their employees. The review found that many published studies had serious flaws which hindered the effectiveness. Several interventions lacked (or failed to mention) a theoretical basis, an insufficient description of their demographic sample, or did not adequately describe their methods of data collection. All of these factors made it difficult to draw conclusions about the effectiveness of the interventions (Glanz, et al, 2007).

Bandura’s social cognitive theory was used as the foundation for this study and selected constructs formed the design-base for the lecture and instructional materials (Bandura, 1986). Behavioral capability promoted knowledge and skill acquisition though training exercises. Modeling examples of sun-protective gear and behaviors supported expectations and observational learning. Examples of incremental personal changes (self-efficacy) or a teamwork approach using workplace friendships (collective efficacy) build employee confidence to perform sun-protective behaviors while on the job.

 This study evaluated two instructional approaches. The first emphasized *collective efficacy* which promoted the practice of sun-protective behaviors using teamwork or work-based collaborative friendships. *Self-efficacy* promoted sun-protective behaviors by encouraging personal responsibility. We theorized that collective efficacy would have a greater impact on knowledge, personal skin cancer attitudes, and would result in a lower sun risk-level score (behavior) when compared with the self-efficacy intervention group or a control group.

 Also examined was whether participant characteristics and demographics (age, marital, ethnicity/race, Fitzpatric Skin Type, and education) affected changes in attitudes, knowledge, sun risk-level scores of the participants. Loma Linda University Internal Review Board approved this study.

**Method**

 *Study Population/Setting*

Employees from San Bernardino County *Head Start* participated in this study. An analysis of daily outdoor work tasks and duration was performed to determine which group(s) of employees spent the most time outdoors. The results showed that teachers spent an average of 5-6 hours per week outdoors compared to clerical employees. For this reason, teachers were chosen as the target population. Teachers from 24 *Head Start* preschool centers were invited to participate in the study. A series of informational lunch-time presentations were used to recruit and consent teachers into the study. The only criterion for exclusion was if participants felt that they had a learning or language limitation that impaired their understanding and completion of the study questionnaire. Identical questionnaires were given to consented participants two weeks prior to and after the intervention.

*Study Design*

 A randomized control group pretest/posttest design was used. The preschool centers were randomized into three groups (*n* = 8 centers per group); a *Collective Efficacy Group (CE)*, *Self-Efficacy Group (SE)*, or the *Delayed Control Group (DI)*.

*Intervention*

The intervention content was based on a skin cancer prevention program created by *CancerQuest* (2004). A review of the Flesh-Kincade Grade Level Readability Index verified that the CancerQuest materials had an index of 13.0, which signified a college freshman reading level. Ultimately the language and images were deemed too “scientific and complicated” to be applicable to this intervention so the curriculum was modified.

 First, only educational components deemed relevant to an occupational environment were selected. The language was simplified; alternate images from the internet were incorporated into the PowerPoint presentation, handouts, and posters. These revisions enhanced the participants understanding of the subjects (skin cancer, ultraviolet radiation, and self-protection). Subsequently the *Flesh-Kincade Grade Level Readability* *Index* was used a second time to determine the suitability of the new materials. The index indicated a reading level of 9.6 or 9th grade. Finally, the intervention title and educational components were given new names.

 *Create Your Own Shade*

 “*Create Your Own Shade*” was the title chosen for this health education intervention. The intervention was specifically designed for preschool teachers who experience on-the-job exposure to sunlight. The components focused on the dangers of unprotected exposure to sunlight and contained practical methods to lessen personal sun exposure. The educational sections were: (1) Introduction to Sun-Safety; (2) Sun-Safety’s Historical Timeline; (3) Skin Color and Skin Biology 101; (4) UV? What’s That? (5) Tree of Knowledge; and (6) the UV Index - Gear Up for Recess. In addition, experimental teaching elements called *Kagan Structures* (2007) were added to each intervention session. These structured activities: (1) encouraged individual (*SE*) or group participation (*CE*); (2) enhanced participant knowledge; and (3) addressed specific constructs of the social learning theory (group or individual observational learning, knowledge, capability, and mastery experiences).

 Teachers in both groups (*CE and SE*) viewed, and received identical resources (two 90-minute educational sessions, handouts, body mole map, UV Index, and PowerPoint presentation content). The difference was the didactic message. Specifically there were: (1) two separate intervention program scripts (*CE* and *SE*). Each script type (CE and SE) either stressed the use of collaborative friendships (teamwork) or personal responsibility as a method to motivate teachers to routinely practice on-the-job sun protective behaviors; (2) both scripts included applicable personal experiences, live program examples, and suggestions on how to pre-plan your daily sun protection routine; (3) the sessions were rigidly planned and timed to insure that the primary message (*CE or SE*), educational components, and activities could be completed; (4) both intervention scripts were thoroughly memorized and meticulously practiced to insure within and between-group uniformity.

 *Study* *Questionnaire*

The study questionnaire included 33 items that were adapted from the CDC National Health Interview (2010 draft); from the American Academy of Dermatology Sun-Telligence survey (2009); and from the Skin Cancer Foundation (n.d.). Included were population demographics, sun-related risk behaviors, knowledge about sun exposure in general and attitudes toward skin protection, sun exposure, and skin cancer risk. Teachers wrote in their study questionnaire responses by hand.

*Population Characteristics and Demographics*

Population and demographics included six items: *age* required the participant to write in the year they were born. *Gender* included: male or female. *Education* included: GED, High School Diploma, Associates Degree, Bachelors Degree, and Other. *Race/ethnicity* included: White non-Hispanic, Black/African American, Mexican-American, Hispanic/Latino, Asian/Pacific Islanders, or Other. *Marital* included: married, widowed, divorced, separated, never married, or living with a partner. For the *Fitzpatrick Skin-Type* scale (Skin Cancer Foundation, n.d.)participants were asked to view six pictures of persons with skin colors that ranged from veryfair (Type I) to very dark (Type VI). They selected one skin color picture that most closely represented their own skin color: pale (Type I), light (Type II), olive/golden (Type III), deep olive (Type IV), brown (Type V), and black (Type VI).

 *Risk-Level Behaviors*

 Nine questions accessed risk-level behaviors of the groups as a whole. Participants were asked to: estimate the number of work hours per week spent in the sun (< 1 hour, 1 to 3 hours, 4 to 10 hours, or > 10 hours), the degree of skin damage that would occur (sunburn with blisters, sunburn that peels, slight burn with some tanning, no sunburn just a tan, or nothing would happen). Next participants were asked if they: were able to stay in the shade, wear a hat, wear a shirt to protect their arms, and whether they ever wore long pants, shorts or a skirt to protect their legs (*always, sometimes, rarely, and never*) when they went outside with their class. Also three questions inquired whether the participant wore sunscreen (*always, sometimes, rarely, and never*), what level of SPF did they use (>SPF 30, SPF 30, < SPF 15, > SPF 15, or Do Not Use) and where they applied the sunscreen (face/arms/legs, arms/legs, legs only, arms only, face only, or do not use sunscreen).

 Each response option was assigned a score (from 1 to 6). Responses were summed and a mean score (risk-level profile) created for each intervention group (*CE*, *SE*, and *DI*).

 *Knowledge*

 Eight items comprised the knowledge portion of the questionnaire. Participants responded (*True*, *False*, or *Not Sure*) to the following statements: ultraviolet rays can penetrate clouds, some types of ultraviolet rays are safe for your skin, you cannot get sunburned on a cloudy day, skin cancer can occur on parts of your body not exposed to sunlight, you only need to wear sun protection when the sun is at its highest peak (directly overhead), sunburn during childhood is related to skin cancer in adults, persons with dark skin do not need sunscreen, and a sunscreen with SPF 30 provides twice the protection as SPF 15.

 Responses were summed and a mean score to created for each intervention group (*CE*, *SE*, and *DI*).

 *Attitudes*

 Participant attitudes toward skin protection, sun exposure, and personal skin cancer risk were assessed using 10 Likert questions. Participants responded (*strongly* *disagree*, *disagree*, *agree* or *strongly agree*) to these statements: I prefer to enjoy sunshine and not worry about protection, sun exposure is good for your health, I have dark skin and don’t have to worry about the sun, I will do anything possible to prevent skin cancer, I feel it is important to protect myself, I am not concerned about skin cancer because it is easily detected, the risks of skin cancer are exaggerated, I do not think I can develop skin cancer, and I am not worried about skin cancer.

 Each response option was assigned a score (*strongly agree* = 1, *agree* = 2, *disagree* = 3, and *Strongly Disagree* = 4). Responses were again summed and a mean score to created for each intervention group (*CE*, *SE*, and *DI*).

**Data Analysis**

 *Analysis*

Data were generated from a self-administered survey which were hand-entered into SPSS 18.0 for database creation and analysis. Following data entry, every 10th survey was rechecked against the previously entered data for accuracy. A complete set of study questionnaires were gathered from 175 respondents. The analysis confirmed the number of participants with complete data sets (pretest and posttest) in each intervention group: *Collective Efficacy Group* (*n* = 65), *Self-Efficacy Group* (*n* = 61), and the *Delayed Control Group* (*n* = 49).

 Frequency analyses were performed on the demographic characteristics. *Age* was re-coded into categories; 23 to 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years and 60 to 71 years. *Marital* had four categories; Single-never married, Married, Divorced, and Other. Frequency analysis created a participant profile.

 The next set of analyses would show whether teachers who receive the *collective efficacy* (teamwork) instructional approach showed greater improvements in their post-test scores (attitudes, knowledge, and sun risk-level) compared to those who received the *self-efficacy* intervention or the control group. A one-way MANCOVA analysis used the six demographic variables (*gender*, *age*, *marital*, *education*, and *Fitzpatric Skin-Type*) as covariates, three posttest scores (*sun risk-level*, *knowledge* and *attitude*) as dependent variables, and the study group (*CE*, *SE*, or *DI*) as the independent variable.

Finally, we wanted to determine if the demographic characteristics (*age*, *marital*, *education*, *race/ethnicity*, and *Fitzpatric Skin-Type*) affected attitudes, knowledge, and sun risk-levels (behavior). A series of multiple regression models were performed for each of the dependent variables (posttest: *attitudes*, *knowledge*, and *sun risk-level*). The posttest scores were the dependent variable while the covariates were the related pretest scores and the six demographics characteristics.

**Results**

*Sample Characteristics*

 Characteristics of the study participants are presented in Table 1. The majority were female (94.9%) with ages ranging from 23 to 71 years (*M* = 45.18, *SD* = 10.38). The racial/ethnic categories were White, Non-Hispanic (14.9%), Black/African American (20.0%), Mexican-American (32.0%), Other Hispanic (21.1%), Asian (6%) or Other (6.3%). As a group 73.7% of the participants were minorities (Black, Mexican-American, Other Hispanic, and Asian), married (58.9%) and most (39%) had some college.

 The analysis of the Fitzpatric Skin-Type scale showed the percentage of participants in each skin color categories: Pale (4%), Light (20.6%), Olive/Golden (17.1%), Deep Olive (42.9%), Brown (16.6), and Black (0.6%). Based on this portion of the analysis, 60% of the program participants self-identified as having a “deep olive” or darker complexion.

[Place Table 1 here]

 First we wanted to determine if teachers who received the *collective efficacy* (teamwork) educational intervention demonstrated greater improvements in attitudes, knowledge, and sun risk-level behaviors compared to sites which received a standard intervention that emphasized *self-efficacy* verses a no-intervention group?”

 After controlling for demographics, the overall multivariate test for the group membership (*CE*, *SE*, or *DI*) was significant, *F* (6, 328) = 6.85, *p* = .001. Post hoc Bonferroni tests showed no differences in post-test knowledge, attitude, or risk-level scores between the *collective efficacy* and *self-efficacy* groups. The *collective efficacy* group had significantly higher posttest scores for all three outcome variables (knowledge, attitude, and risk-level) than the *delayed intervention* group, while the *self-efficacy* group had significantly higher posttest scores than the *delayed intervention* group for risk-level (*p* = .002) and knowledge (*p* = .001) variables but was borderline significance for attitude (*p* = .06). Table 2 displays the results of the analyses.

[Place Table 2 here]

 We also examined whether demographic characteristics (*age*, *marital*, *education*, *race/ethnicity*, and *Fitzpatric Skin-Type*) affected attitudes, knowledge, and sun risk-levels (behavior). Table 3 shows that 54.0% of the variation in post-test *attitude* scores were explained by the variables in the model (p = .001). Table 3 also shows that participants in the *CE* and *SE* groups showed greater improvements in their posttest attitude scores than did the *DI* group (*Collective Efficacy Group* β = .28, *p* = .001; *Self-Efficacy Group* β = .17, *p* = .01), even when controlling for pre-test attitude scores and demographic variables. Other variables that were independently related to posttest attitude scores included ethnicity (Black β = -.23, *p* = .003), Fitzpatric Skin-Type (β = .22, *p* = .002); and attitude pre-test scores (β = .59, *p* = .001).

 For posttest knowledge scores, 35.6% of the variation (Table 3) was explained by variables in the model (*p* =.001). Participants in the *CE* and *SE* groups showed higher posttest knowledge scores (*Collective Efficacy* *Group* β = 1.36, *p* = .001; *Self-Efficacy Group* β = 1.67, *p* = .001), even when controlling for pretest knowledge scores and demographic variables. The only other variable that was independently related to posttest attitude scores was knowledge pre-test scores (β = .21, *p* = .001).

 For posttest sun risk-level scores (Table 3) 52.8% of the variation (Table 3) was explained by variables in the model (*p* = .001). Again *CE* and *SE* study group participants showed lower posttest sun risk-level scores (*Collective Efficacy Group* β = -3.13, *p* = .001; *Self-Efficacy* *Group* β = -2.91, *p* = .001), even when controlling for pre-test risk-level scores and demographic variables. Other variables that were independently related to posttest attitudes included ethnicity (Hispanic β = -1.53, *p* = .004, and risk-level pre-test scores (β = .44, *p* = .001). Table 3 displays the results of the analyses.

[Place Table 3 here]

**Discussion**

 The health education intervention curriculum used for this research titled “*Create Your Own Shade*” was specifically designed for *Head Start* preschool teachers in San Bernardino County who experience on-the-job exposure to sunlight. Two teaching approaches were used and evaluated. The *collective efficacy* intervention used teamwork to promote sun-protective behaviors. The *self-efficacy* intervention employed an individualized personal-responsibility approach. We theorized that the collective efficacy approach would have a greater impact on knowledge, attitudes, and lower sun risk-level (behaviors) than the self-efficacy or delayed intervention control groups.

 The results showed that both intervention types (*CE* and *SE*) produced significant improvements (*p* = .01, *p* = .001) in attitudes, knowledge, and sun risk-level (behavior) when compared to a control group.

 The study also explored whether pretest scores (attitudes, knowledge, and sun risk-level), demographics, and group assignment (*CE*, or *SE*) would have an effect upon posttest scores (attitudes, knowledge, and sun risk-level). Results indicated Hispanic participants had borderline (*p* = .07, *p* = .08) lower levels of posttest knowledge and attitudes but practiced significantly (*p* = .004) more sun risk-level behaviors (posttest). Results also indicated that Black participants had significantly lower (*p* = .003) posttest attitudes even after controlling for the covariates. Previous studies have shown that sun-safe behavior reflects cultural norms. According to Glanz et al, (2007), culture (and gender) has strong influences on sun-safe beliefs. White non-Hispanic workers seemed more likely to wear protective covering (hats, sunglasses, and sunscreen) than other ethnic-racial groups (Pichon, et al, 2006). In addition Fitzpatric Skin-Type (lighter self-identified skin colors only), was positively related to higher posttest attitude scores (*p* = .002), which may also be indicative of cultural norms as well as decades of targeted nationwide skin cancer prevention messages that have specifically targeted lighter-skinned populations (Pichon, et al, 2006).

 Black participants showed significantly lower posttest attitudes toward skin protection even though the intervention educational materials provided vivid examples of basal cell, squamous cell, and melanoma occurrences on dark skin. The intention was to counteract cultural norms which assert that skin cancer does not occur in persons with dark skin.

 Although difference between the *CE* and *SE* groups were not found, the results indicate that either intervention type could be used to teach simple sun-safe practices for preschool teachers to use while at work. This study shows that collective efficacy (teamwork) can be used to teach preventive health practices. Future studies are necessary to validate using collective efficacy (teamwork) as a foundation for occupationally-based sun-protective educational interventions.

 *Study Limitations*

This study is not without limitations. The planned distinctions between the *SE* and the *CE* groups were not pronounced enough to determine if they differentially affected outcomes. Therefore, any effects between the collective efficacy group and the self-efficacy group may have been missed. However, both educational interventions showed significant improvements in the areas of knowledge, attitudes, and risk-level when compared to the control group. This study showed that either intervention type (*CE* or *SE*) can be effective teaching methods for skin cancer prevention.

The intervention was available to teachers, who work at *Head Start* preschool centers located within urban municipalities of San Bernardino County, California. Hence, teachers who work for *Head Start* in other areas may not respond in the same manner. In addition, the surveys were self-administered and therefore preventive health behaviors may have been overestimated and self-reported risk behaviors underreported. Finally, prizes were awarded at each educational session which (hats, sunglasses, and sunscreen) which may have created social desirability for the overall program.

 *Implications for Practice*

 Educational interventions that teach on-the-job sun-protective practices occur very infrequently. The concept of collective efficacy (teamwork) as an instructional approach has not been widely examined to determine its effectiveness in promoting sun-protective practices. In this research, we endeavored to address both health education gaps. The educational components, materials, and curricula were specifically created for preschool teachers who are exposed to sunlight during outdoor school recess periods. The educational components used key concepts from the social cognitive theory. The components were interesting, lively, and fun as a way to introduce and reinforce the sun-protective messages to preschool teachers. The greatest impact would likely occur if a comprehensive sun-protection intervention were directed at both employee and employer in tandem. Additionally, a yearly continuing education seminar (booster session) may be necessary to increase and reinforce the desired behavior.

The findings from this study may be useful for developing future occupationally-based skin cancer prevention education. Future research should continue to include multiple groups and randomization in addition to extended follow-up periods, and perhaps biological assessments.

**Declaration of Conflicting Interests**

The authors declared no potential conflicts of interest with respect to the authorship and/or publication of this article.

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| --- |
| Table 1. Characteristics of the Sample (*n* = 175) |
|  (*n*) %  |
| **Group** |
|  Collective Efficacy | 65 37.1 |
|  Self-Efficacy | 61 34.9 |
|  Delayed Intervention | 49 28.0 |
|  |  |
| **Demographics** |  |
|   |  |
| **Gender** |  |
|  Women | 166 94.9 |
|  Men | 9 5.1 |
|  |  |
| **Age** |  |
|  23 to 29 years | 17 9.7 |
|  30 to 39 years |  35 20.0 |
|  40 to 49 years | 63 36.0 |
|  50 to 59 years | 43 24.6 |
|  60 to 71 years | 17 9.7 |
|  |  |
| **Racial/Ethnic** |  |
|  White, Non-Hispanic | 26 14.9 |
|  Black | 35 20.0 |
|  Mexican-American | 56 32.0 |
|  Other Hispanic | 37 21.1 |
|  Asian | 10 5.7 |
|  Other | 11 6.3 |
|  |  |
| **Marital** |  |
|  Single-Never Married | 29 16.6 |
|  Married | 103 58.9 |
|  Divorced | 22 12.6 |
|  Other | 21 12.0 |
|  |  |
| **Education** |  |
|  GED  | 13 7.4 |
|  High School | 44 25.1 |
|  Associates Degree | 68 38.9 |
|  Bachelors Degree | 35 20.0 |
|  Other | 15 8.6 |
|  |  |
| **Fitzpatric Skin Color** |  |
|  Pale | 4 2.3 |
|  Light | 36 20.6 |
|  Olive/Golden | 30 17.1 |
|  Deep Olive | 75 42.9 |
|  Brown  | 29 16.6 |
|  Black | 1 .06 |
| a. Age: M=45 yearsTable 1. Frequency counts and percentages for study population demographic variables (N = 175) |

|  |
| --- |
| Table 2. *MANCOVA – Adjusted Mean Scores a for Improvement in* *Sun Risk-Level, Knowledge, and Attitudes Based on Group (N = 175)* |
|  |
| Improvement Score | Groupb | *M* | *SE* |
|  |  |  |  |
| Sun Risk-Level c | CE | 4.51 | 0.47 |
|  | SE | 4.93 | 0.48 |
|  | DI | 2.43 | 0.54 |
|  |  |  |  |
| Knowledge d | CE | 2.41 | 0.21 |
|  | SE | 2.83 | 0.22 |
|  | DI | 1.12 | 0.24 |
|  |  |  |  |
| Attitude e | CE | 0.25 | 0.04 |
|  | SE | 0.18 | 0.04 |
|  | DI | 0.04 | 0.04 |
|  |  |  |  |
| a Improved scores were adjusted for the respondent’s age, racial/ethnic background, marital status, educational level and skin color.b Group: CE = *Collective Efficacy* (*n* = 65); SE = *Self-Efficacy* (*n* = 61); DI = *Delayed Intervention* (*n* = 49).c Bonferroni post hoc tests: CE ≈ SE (*p* = 1.00); CE > DI (*p* = .01); SE > DI (*p* = .002).d Bonferroni post hoc tests: CE ≈ SE (*p* = .54); CE > DI (*p* = .001); SE > DI (*p* = .001).e Bonferroni post hoc tests: CE ≈ SE (*p* = .48); CE > DI (*p* = .001); SE ≈ DI (*p* = .06). |

|  |
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| Table 3. *Prediction of Posttest Knowledge, Attitudes, and Sun Risk-Level Based on Pretest Score, Demographics, and Group*(*N = 175*) |
|  |  |  |  |  |
| **Variable** | B | SE | β | *p* |
|  |  |  |  |  |
| *Knowledge* |  |  |  |  |
| Intercept | 5.38 | 0.70 |  | .001 |
| Pretest Knowledge | 0.21 | 0.05 | .26 | .001 |
| Age | 0.01 | 0.01 | .05 | .44 |
| Hispanic a | -0.40 | 0.22 | -.15 | .07 |
| Black a | -0.07 | 0.34 | -.02 | .83 |
| Married a | -0.32 | 0.17 | -.12 | .07 |
| Education | -0.12 | 0.11 | -.07 | .27 |
| Fitzpatric Skin Color | 0.02 | 0.11 | .02 | .82 |
| **Collective Efficacy** a | 1.36 | 0.21 | .49 | .001 |
| **Self-Efficacy** a | 1.67 | 0.22 | .59 | .001 |
|  |  |  |  |  |
| *Attitude* |  |  |  |  |
| Intercept | 1.13 | 0.20 |  | .001 |
| Pretest Attitude | 0.59 | 0.05 | .68 | .001 |
| Age | 0.00 | 0.00 | .01 | .91 |
| Hispanic a | -0.07 | 0.05 | -.10 | .08 |
| Black a | -0.23 | 0.08 | -.25 | .003 |
| Married a | -0.04 | 0.04 | -.05 | .31 |
| Education | -0.01 | 0.02 | -.03 | .64 |
| Fitzpatric Skin Color | 0.08 | 0.03 | .22 | .002 |
| **Collective Efficacy** a | 0.21 | 0.05 | .28 | .001 |
| **Self-Efficacy** a | 0.13 | 0.05 | .17 | .01 |
|  |  |  |  |  |
| *Sun Risk-Level (behavior)*  |  |  |  |  |
| Intercept | 11.11 | 1.94 |  | .001 |
| Pretest Risk-Level | 0.44 | 0.04 | .55 | .001 |
| Age | 0.01 | 0.02 | .02 | .70 |
| Hispanic a | 1.53 | 0.52 | .20 | .004 |
| Black a | 0.60 | 0.79 | .06 | .45 |
| Married a | 0.62 | 0.41 | .08 | .14 |
| Education | 0.19 | 0.26 | .04 | .46 |
| Fitzpatric Skin Color | -0.42 | 0.26 | -.12 | .11 |
| **Collective Efficacy** a | -3.13 | 0.52 | -.40 | .001 |
| **Self-Efficacy** a | -2.91 | 0.52 | -.37 | .001 |
| a Coding: 0 = *No* 1 – *Yes*. Full Model *Knowledge*: *F* (9, 165) = 10.14, *p* = .001. *R*2 = .356 Full Model *Attitude*: *F* (9, 165) = 21.53, *p* = .001. *R*2 = .540 Full Model *Risk-Level* *F* (9, 165) = 20.49, *p* = .001. *R*2 = .528. |