

Encouraging Employers to Promote Safe-Sun Behaviors among Outdoor Workers

Aaron Entringer¹, Laura Brannon², & Whitney Whitaker³

¹Onlife Health

²Kansas State University

³Fort Hays State University

Abstract

Sun exposure, with its link to the development of skin cancer and other health issues, can be a serious health hazard. In particular, those who primarily work outdoors and are consistently exposed to the sun's rays are at elevated risk for such health problems. In an effort to promote sun protection behaviors among employees, we focused on managers and supervisors who may influence change from the top-down. Using a four-level between-subjects intervention, it was found that managers and supervisors who received messages that emphasized the financial consequences of employee sun exposure had greater intentions to encourage sun protection behaviors in their employees than those who received a message focused solely on employee well-being. This finding indicates that employers may be most concerned with financial consequences when it comes to promoting employee health. Findings provide insight into the most effective methods for promoting sun protection for outdoor workers.

Key Words: Occupational Health; Occupational Safety; Supervisors; Safe-Sun Behaviors; Health Messaging

Encouraging Employers to Promote Safe-Sun Behaviors among Outdoor Workers

As the American Academy of Dermatology (AAD, 2018) reports, skin cancer has become the most common form of cancer in the U.S. with approximately 9,500 new diagnoses made each day. To aid in the prevention of this disease, it is necessary to study populations most at risk of developing skin cancer. Outdoor workers, who spend long periods of time exposed to the sun's UV rays, represent such a group. The Occupational Cancer Research Centre (2017) estimates that outdoor workers have 2.5 to 3.5 times greater risk of developing skin cancer than the average indoor worker. This elevated risk may be due, in part, to the lack of sun protection behaviors (Nahar et al., 2013; Nahar et al., 2014; Peters et al., 2016). To help reduce skin cancer risk for outdoor workers, the current work focused on messaging that may help promote safe sun behaviors. Specifically, this work focused on impacting change at the employer-level by testing the effects of appeals on the well-being of employees versus appeals on financial incentives for employers. Given a lack of research in this area, particularly as it relates to sun protection programs and the most effective methods for promoting sun protection among outdoor workers, the current work provides further insight into communicating risk and enacting health promotion and change from the top-down. Although preliminary, the findings of the current work should assist with filling gaps in the knowledge base on effective methods for promoting sun protection and may lead to reducing health risks for such an at-risk population in outdoor workers.

Role of the Workplace in Sun Protection

Though an abundance of research conducted on safe sun protection for outdoor workers has been conducted from the perspective of employees, researchers note the important role of employers and workplace support. In general, supervisors play an important role in not only influencing employee responses to safety-related (Freitas, Silva, & Santos, 2019) and health-related trainings (Ellis, Casey, & Krauss, 2017), but also safety-related behaviors and employee compliance with safety policies (see Yanar, Lay, & Smith, 2019). Employee perceptions of managerial values and commitment to occupational safety and health are often related to increased promotion of safe work-related behaviors (see Clarke, 2006; Clarke, 2010) and increased motivation on behalf of employees to commit to safety performance behaviors (see Christian et al., 2009).

When focusing directly on safe sun behaviors, Woolley et al. (2008) examined the effect of workplace policies by comparing outdoor workers who have a mandatory sun protection policy with workers who have a voluntary policy. Employees at worksites with mandatory sun protection policies had fewer solar keratoses (i.e. warts from sun damage) and fewer reported instances of skin cancer than employees at worksites with a voluntary sun protection policy. Hammond et al. (2008) surveyed outdoor workers in New Zealand about the role that their workplace plays in their own personal sun protection and found that perceived workplace support was significantly associated with increased sun protection practices. In a related study of outdoor workers from New Zealand, researchers surveyed workers about their attitudes and behaviors toward sun protection; workplace support was again associated with sunscreen use. Further, workplace support, along with prioritization of sun protection, concern about sun exposure, and knowledge about sun exposure, accounted for 37% of the variance in sunscreen use (McCool et al., 2009). These studies indicate that workplace support and policies can play a significant role in employees' sun protection decisions and health outcomes.

Janda et al. (2014) surveyed outdoor workers across several industries in Australia regarding their thoughts and behaviors toward sun protection. Findings suggest that 53% of workplaces had some form of sun protection policy and 50% of workplaces provided some form of education on sun protection. Those who received education on sun protection from employers were significantly more likely to practice sun protection behaviors. Recently, Schilling et al. (2018) sampled German outdoor workers to determine perceived workplace support of sun protection behaviors. Participants who perceived workplace support showed greater concern about the dangers of sun exposure, were more likely to use sunscreen, and were more likely to stay in the shade during work hours. Outdoor workers who perceived that their supervisors practiced sun protection behaviors were more likely to practice these behaviors themselves, such as by wearing long-sleeved shirts and sunglasses. Importantly, the influence that employers and organizations can have on safer work-related behaviors extends to other health-related ailments, such as heat stress. In a study conducted in 2019, researchers found that the implementation of an organization-wide *Heat Stress Awareness Program* among outdoor workers in Texas was related to a decrease in the total number of heat-related illnesses as well as a 50% decrease in workers' compensation costs (McCarthy, Shofer, & Green-McKenzie, 2019). As these studies indicate, employers (and organization-wide programming) can have a significant impact on their employees' safe work behaviors.

Employer-Targeted Sun Protection Interventions

Whether it is by providing workplace support (Hammond et al., 2008; McCool et al., 2009; Schilling et al., 2018), education (Janda et al., 2014), behavioral modeling (Schilling et al., 2018), or mandatory policies (Woolley et al., 2008), employers can play a significant role in their employees' sun protection habits. However, interventions targeting employers directly are almost entirely non-existent. To examine what motivates employers to act in favor of their employees' health, researchers have interviewed decision-makers. Miller and Haslam (2009) interviewed occupational health and safety professionals in the United Kingdom to explore attitudes and motivations regarding employee health investment. They noted that many individuals felt it was "the right thing to do" and reported that employee health and well-being was a key motivator in decision-making. Notably, interviewees also touched on the financial and business ramifications by noting things such as legal compliance, cost of illness, insurance premiums, and loss of productivity. Van Dongen et al. (2013) conducted a similar study, however, their sample consisted of occupational health decision-makers in Canada (or professionals who directly influence matters relevant to occupational health. This sample was selected to examine directly the process by which "occupational health decisions are made; the importance given to the financial implications of OHS interventions; the sources of information used during the decision-making process; and occupational health decision-makers' knowledge about different economic evaluation methods" (p.2). While some participants mentioned their moral obligation to help employees, participants primarily focused on financial implications of occupational health and safety interventions, especially the employer's costs and benefits.

Pescud et al. (2015) interviewed business owners and managers regarding their thoughts on worker health. Productivity was the most frequently mentioned outcome of importance for healthy workers. While there was some mention of employee well-being, interviewees largely focused on the business and financial impacts of employee health. Terrés, Castejon, and Mondelo (2013) compared intrinsic (e.g., moral responsibility) and extrinsic (e.g., legal compliance) motivation for implementing health and safety programs among managers of construction firms in Spain. Extrinsic factors led to greater concern among supervisors, and potentially even behavioral, worksite, or policy changes. The authors recommend that future interventions aimed at supervisors should focus on the financial implications of health outcomes.

In general, researchers have considered the financial impact of skin cancer on productivity and business expenses. For example, Leigh (2011) demonstrated the business-related case for safety by estimating the economic costs associated with various occupational injuries, such as the development of skin cancer. Specific to sun-protection behaviors, the CDC (2018-a) reports that every year, Americans lose more than \$100 million in productivity because of restricted activity or absence from work due to skin cancer. Ekwueme et al. (2011) estimate that annual productivity losses in the U.S. attributed to melanoma are roughly \$3.5 billion, though this number incorporates the economic effects of skin cancer deaths. The CDC (2018-a) notes that in some states, employers may even be required to provide workers' compensation to employees who develop skin cancer as result of sun exposure on the job.

The Occupational Safety and Health Administration's (OSHA) *Safety Pays* program also focuses on the protection of workers through appeals to organizational loss in productivity and revenue. This program was designed to allow employers opportunities to estimate the potential negative impact of work-related injuries and illnesses on profitability through both direct and indirect costs (OSHA, 2015). The *Safety Pays* program encourages employers to be proactive in developing safer working conditions for employees by enhancing understanding of the financial costs associated with occupational accidents and illnesses. Taken as a whole, this information suggests that appeals to the financial impacts of occupational health-related issues may serve as a means to motivate employers and organizations to adopt safer work practices and policies. However, more research is needed to better understand just how financial appeals may effectively promote supervisors to encourage workers to practice safe work-related behaviors; specific to the current study, safer sun-protection behaviors. Given both the health risks and financial costs of unsafe sun behaviors, previous studies suggest that this type of research focused on supervisors and the financial implications of health outcomes should be a priority (Terrés et al., 2013).

Overview of the Current Study

Previous research indicates a causal link between safety motivation and behavior and suggests that the more motivated an employee is to practice safe work-related behaviors, the more likely they are to engage in said behavior. In addition, while some governments and certain workplaces mandate that a safe and healthful workplace be guaranteed, the creation of safe work environments often relies on both employees and decision makers being motivated to practice safe work-related behaviors (see Hedlund et al., 2016). The current work focused on supervisors who may influence change from the top-down. Supervisors' intentions to encourage safe sun behaviors among employees were assessed; intentions to promote behaviors were measured, and the prior research suggesting a link between motives/intentions and behaviors was used as a guide for this work.

Supervisors read one of four messages (control, employee well-being, employer financial, and combined) and answered questions regarding encouraging safe sun behaviors. As some studies have indicated the important role of employers in promoting safe sun protection (Clarke, 2006; Clarke, 2010; Christian et al., 2009; McCarthy et al., 2019) but few have actually tested interventions (i.e., a message-approach), this work represents a necessary initial step in this domain. Past research primarily has focused on employee well-being rather than business and financial outcomes (Leigh, 2011; OSHA, 2015; Terrés et al., 2013) behind the implementation of health and safety programs. Given limited research that directly has examined which appeals (e.g., financial reasoning or employee health and well-being reasoning) might be most effective at encouraging employers to promote safe work-related behaviors, the present study sought to determine which of these appeals would be most appropriate for safe-sun promotion. Acknowledging that employee well-being is an important consideration among employers, and that business and financial outcomes also are an important focus among most decision-makers, we designed research questions to examine these appeals. Specifically, we explored the following questions: which motives might be more/less important when influencing employers' intentions to promote safe sun behaviors? Is there a combined effect or incremental advantage to using both motives that appeal to employers' financial reasoning as well as employee health and well-being?

Method

Participants

One hundred and ninety-five participants were recruited from the U.S. through Amazon's Mechanical Turk (MTurk). This is an online, crowdsourcing marketplace that allows researchers to reach a wide variety of

participants who might be interested in participating in a research study. Surveys are posted to this platform and made available to participants for a small monetary incentive. This platform is supported in prior research as a credible source for occupational health research (Michel et al., 2017) and organizational research (Keith, Tay, & Harms, 2017; Landers & Behrend, 2015). Participants consisted of self-identified managers, assistant managers, or supervisors of outdoor workers. Of the initial participants, 43 were removed for failing to be a manager of outdoor workers and 13 participants failed at least one of the attention checks (described below). This resulted in a final data set of 139 participants. Participant ages ranged in years from 22 to 71, with an average age of 37.31 ($SD = 10.75$) and 94 participants identified as male (67.6%). The majority of the sample was White/Caucasian (67.6%). When asked to select their highest level of education, a majority responded with a 4-year degree (50.4%). Construction (30.2%) was the most commonly cited industry. Most respondents were employed full-time (95.7%). Participants reported an average of 27.97 ($SD = 67.92$) employees supervised (median of 10) and an average of 14.25 ($SD = 26.88$) supervised employees who spend significant amounts of time working outdoors (median of 7). See Table 1 for additional sample descriptive information.

Design

The current work tested the effects of a single between-subjects independent variable (Message type) with four levels on participants' intended encouragement of sun protection behaviors in their employees and various attitudes toward sun protection.

Intervention

All four intervention messages were of the same text-based format and kept to similar lengths. Much of the content for three of the four messages (excluding the control message) was adapted from an advertisement by the AAD (2018). Efforts were made to keep wording and phrasing similar between conditions where appropriate. To view the intervention messages in their entirety, please see Appendix A.

Message Type

Participants were randomly assigned to read one of the four messages. In the *employee well-being* condition, the message emphasized the potential health and wellness consequences that excessive and unsafe sun exposure can have on the supervisors' employees. Content focused on issues related to skin cancer and other health ailments related to sun exposure that could result in physical and emotional suffering for employees. In the *employer financial* condition, the message emphasized the potential financial consequences that excessive and unsafe sun exposure may have on their workplace or business. This included information from the Center for Disease Control (2018) relating to monetary amounts lost in productivity and potential workers' compensation regulations. The *combined* condition included information from the previous two conditions and presented participants with information related to both their employees' well-being and the potential financial consequences for their workplace or business. Finally, the *control* message contained information about different industries that feature outdoor work and was adapted from the *Learn How to Become: Careers in the Great Outdoors* website (2018). This condition was purposefully intended to have innocuous content to serve as a suitable comparison.

Measures

Pretest Sun Protection Behaviors

Six items measured the extent to which participants encouraged sun protection behaviors among employees (adapted from Heckman et al., 2017). This included encouraging the use of sunscreen, head protection, long-sleeved shirts, long pants, sunglasses, and seeking shade while outdoors. An example item includes: "In the past summer, how often did you encourage your employees to use sunscreen while outdoors?". Items were assessed using a 7-point Likert type scale ranging from "Never" to "Frequently." A composite variable was created by calculating the average of the six items assessing pretest encouragement items. Cronbach's Alpha for this variable indicated adequate internal consistency ($\alpha = .88$)

Table 1
Participants' Descriptive Information

Measure	Items	Frequency (%)	Mean	SD	Median
Sex	Male	94 (67.6)			
	Female	45 (32.4)			
Race	White/Caucasian	94 (67.6)			
	Black/African American	13 (9.4)			
	Asian/Pacific Islander	11 (7.9)			
	Hispanic	11 (7.9)			
	American Indian	7 (5.0)			
	Other	3 (2.2)			
Education	High School Graduate	12 (8.6)			
	Some College	24 (17.3)			
	2-Year Degree	16 (11.5)			
	4-Year Degree	70 (50.4)			
	Graduate/Professional Degree	17 (12.2)			
Industry	Construction	70 (50.2)			
	Technology	18 (12.9)			
	Landscaping	11 (7.9)			
	Farming	10 (7.2)			
	Other	30 (21.8)			
Employment	Full-Time	133 (95.7)			
	Other	6 (4.3)			
Age			37.31	10.75	
Hours worked per week			44.11	9.19	
Employees supervised			27.97	67.92	10.0
Employees working outdoors			14.25	26.88	7.0

Note. $N = 139$

Posttest Sun Protection Intentions

Following the intervention messages, participants completed items assessing future intentions to encourage sun protection behaviors among employees. Six items covering the same protection behaviors measured in the pretest were used, each assessed on a 7-point Likert type scale. For example, "In the future, how often do you intend to encourage your employees to use sunscreen while outdoors?". A composite variable was created by calculating the average of the six items assessing posttest encouragement items. Cronbach's Alpha for this variable indicated adequate internal consistency ($\alpha = .93$).

Attention and Manipulation Checks

To ensure that each intervention message was being read and understood and that participants were not carelessly responding to items, attention and manipulation check questions were placed at the bottom of the page after the intervention message content. The attention checks included items such as "Please enter today's date." Additionally, the manipulation check item asked participants to provide a brief summary of the message they had just read. Thirteen participants failed at least one of the attention checks and/or did not provide a sufficient summary about the intervention message. These participants were removed from all analyses.

Procedure

Participants completed an online survey in Qualtrics which was distributed using MTurk. Participants read the informed consent, and then responded to items assessing work information (e.g., the industry in which they work). Next, participants responded to items assessing their current encouragement of sun protection behaviors among employees. Participants were randomly assigned to one of the four message types. After participants viewed

the message and responded to the attention check, they answered questions related to future intentions to encourage sun protection behaviors among employees. Participants completed demographic information, were debriefed, and paid through their MTurk account.

Results

An ANCOVA was used to test for the effect of *message type* on the dependent variable of posttest sun protection encouragement intentions. The ANCOVA was used to assess the research questions, “which motives might be more/less important when influencing employers’ intentions to promote safe sun behaviors? Is there a combined effect or incremental advantage to using both motives that appeal to employers’ financial reasoning as well as employee health and well-being?”. Significant effects were examined through pairwise comparisons using a Sidak adjustment due to its relatively liberal correction while maintaining a familywise error rate of .05 (Hayes, 2005).

Before conducting the analysis, the assumptions of ANCOVA were tested. Homogeneity of regression slopes was found indicating that there was no interaction between the covariate and the independent variable. Similarly, Levene’s test of homogeneity of variance was found to be non-significant ($p > .05$), indicating that variance was roughly equal between groups. Linearity was found to be present, with a scatter plot indicating that the dependent variable-covariate relationship was approximately linear. After calculating residuals, the Shapiro-Wilk test of normality indicated no significant variation of normality for the variables of pre- and posttest encouragement. Further examination through histograms confirmed this result and showed approximately normal curves while Q-Q plots revealed that these variables did not show departures from normality.

To test the main effect of *message type* on the posttest measure of sun protection encouragement intentions, an ANCOVA was run with *message type* as the predictor, posttest encouragement as the dependent variable, and the pretest encouragement as the covariate. Message type included a control, employee well-being, employer financial, and combined message. Pretest and posttest measures of sun protection encouragement intentions were measured through items assessing how often employers encouraged the use of sub protection (see Measures section). Composite scores were created for both pre- and post-encouragement intentions by calculating the average of the items used to assess sun protection encouragement.

A main effect of *message type* was found, $F(3, 134) = 15.83, p < .01$, partial $\eta^2 = .26$. Participants in the *control* condition ($M = 4.71, SE = .16$) scored significantly lower on the posttest measure of sun protection encouragement intentions than participants in the *employee well-being* ($M = 5.39, SE = .16, p = .02$), *employer financial* ($M = 6.02, SE = .16, p < .01$), and *combined* ($M = 6.10, SE = .16, p < .01$) conditions (see Table 2). The adjusted mean difference between the *employee well-being* and *employer financial* conditions was significant ($p = .04$), as was the adjusted mean difference between the *employee well-being* and *combined* conditions ($p = .01$). The adjusted mean difference between the *employer financial* and *combined* conditions was not significant ($p = 1.00$).

Table 2

Adjusted Means and Standard Errors for the Message Type Variable in the Analysis of Covariance (ANCOVA) on the Dependent Variable of Posttest Sun Protection Encouragement Intentions

Message Type	Posttest Means (SE)
Control	4.71 ^a (.16)
Employee Well-Being	5.39 ^b (.16)
Employer Financial	6.02 ^c (.16)
Combined	6.10 ^c (.16)

Note. Standard errors are located in parentheses. Adjusted means with different superscripts indicate a main effect where those adjusted means differed significantly from one another in pairwise comparisons.

Discussion

This study explored which message types are most effective for encouraging supervisors' intentions to promote sun protection behaviors among employees. Findings indicate that participants in the *control* condition scored significantly lower on the posttest measure of sun protection encouragement intentions than participants in each of the three other conditions. Thus, the control message was not as effective as the other three messages at promoting posttest sun protection intentions. Participants in the *employee well-being* condition scored significantly lower on the same measure than both the *employer financial* and *combined* conditions. The *combined* message and *employer financial* message were the most effective at promoting intentions when compared to the *employee well-being* message and *control* message. This order of effectiveness adds important information to existing literature. Focusing on the financial consequences of unsafe sun exposure was an effective method for encouraging supervisors' intentions to promote safe sun behaviors among employees. However, the role of employee health should not be ignored, as the current findings indicate that focusing on employee well-being was more effective than the control message. While information pertaining to employer financial reasoning to encourage intentions to promote safe sun behaviors might be useful on its own (and perhaps more useful than the employee well-being message on its own), the intent in messaging should be secondary to the actual health and safety of employees. Scores in the *combined* condition were generally the highest; however, focus on the financial message on its own appears to be more effective than the focus on well-being alone. This may suggest that focusing on financial and employee health consequences of unsafe sun exposure together would be important, but if financial reasoning is provided, well-being reasoning may not be needed in order to elicit greater intentions to promote safe sun behaviors.

Implications

From a theoretical perspective, this study represents a necessary early step in addressing safe sun protection at the employer level. While previous studies in this topic area have focused directly on outdoor workers and perceptions of workplace policies, this work takes a top-down approach by examining the role of supervisors. Although previous research with respect to sun-protection among outdoor workers is limited, of the available research, findings suggest that employers play an important role in their employees' decision to use sun protection (see Schilling et al., 2018; Woolley et al., 2008). The current work illustrates that financial concerns are important when it comes to intentions to promote safety by supervisors. This supports findings from qualitative studies that have examined key motivators of employers taking preventative action regarding employee health (Pescud et al., 2015). The effects found may be applicable in domains associated with work-related behaviors but outside of sun protection. This could include employee health areas associated with work-related stress. Although further research is necessary, this study represents an important early exploration into the potential of encouraging intentions to promote health behaviors in employees through their employers.

Current findings also add beneficial statistical and practical information to prior research and literature. Although the mean difference found for each message type were small and the effect size found in the current work (partial $\eta^2 = .26$) represents a relatively small effect compared to standard conventions (Cohen, 1998), the effect of UV exposure itself is small, but cumulative. If methods, such as emphasizing both financial and health-related consequences of unsafe sun behaviors to employers serves to increase intentions to even occasional use of sun protection among outdoor workers, then this may still produce a cumulative difference over time. Similar to research that has explored other avenues of health messaging (e.g., anti-smoking messaging, Wangberg et al., 2011; Webb Hooper, Rodriguez, & Baker, 2013; financial incentives to reduce smoking, Volpp et al., 2009), even when individuals do not entirely stop the unsafe behavior or only make small reductions in the behavior (e.g., cutting back, but continuing to smoke), reducing this behavior to some extent can help and may even lead to greater future reductions in the unsafe behavior. As such, while the effect size is small in the current work, even a small effect, or some intention to change to unsafe sun behavior(s) through this messaging approach, may still lead to a larger cumulative difference in overall UV exposure.

Findings also provide a practical potential blueprint for practitioners in the health communication area. To effectively promote intentions of sun protection behaviors among outdoor workers, it may be necessary to target workers from a top-down level. Practitioners should attempt to persuade supervisors of outdoor workers by focusing not only on health consequences, but also financial consequences. One such method for doing so may be through providing utility analyses to employers that focus on the financial outcomes that employers can reasonably expect as a result of instituting an employee sun protection program. As mentioned previously, programs such as *Safety Pays*

(OSHA, 2015) have utilized financial models to illustrate other work-related hazards. Providing this type of financial data could lead to greater instances of employers encouraging sun protection in employees and, ultimately, greater sun protection.

Limitations and Future Directions

While the findings are promising, limitations should be noted. The sample was gathered from Amazon's MTurk service. Although numerous studies support the use of MTurk samples (Keith et al., 2017; Landers & Behrend, 2015), there remains the possibility of issues such as inattention or fraudulent responding. Recommendations from Cheung et al. (2017) were undertaken, including the use of attention checks and multiple questions asking participants to describe their job in detail. Despite these steps, it is impossible to confirm all participants were being truthful. Future research may benefit from sampling participants in-person from an outdoor worksite.

There also may be a potential issue with the primary dependent variable focusing on intentions rather than actual behaviors. When designing the current work, relevant literature suggesting a causal link between safety motivation and actual safety behaviors was used as a guide. Important for the current study, decision makers can empower and influence employee safety motivation which then may translate to both safety performance (or behaviors) and better compliance and participation in safety related initiatives (Martínez-Córcoles et al., 2012; 2013). The current study found that using the combined message that appeals to both employee well-being and financial motivations to promote safety were more effective than appealing to these two motives separately. Even though previous researchers have offered support for intentions translating to actual behavioral change in general (Hamilton et al., 2017) and specific to work behaviors (Martínez-Córcoles et al., 2012; 2013), as well as Ajzen's Theory of Planned Behavior (1991) posits that intentions are one of the best predictors of actual behavior, it is possible that the intentions measured will not translate to actual behavior. As such, this is a promising initial finding; however, more research is needed to expand on the safety motives used in the current work and how that might translate to actual behaviors. Furthermore, the results should be interpreted cautiously in terms of actual behavioral change. Finally, the effect size of .26 may be small (Cohen's, 1988). The relatively short intervention, which consisted of a single message, may explain this small effect. However, any apparent increase in the encouragement of sun protection behaviors among outdoor workers is a worthwhile endeavor as described above. As the odds of contracting skin cancer increase with the amount of sun damage, any increase in sun protection behaviors could make a considerable difference in health outcomes.

This work provides important information for practitioners to use when crafting messaging for employers of outdoor workers. Focusing on financial consequences for employers would be the most effective content area to pursue. This can include information related to productivity losses, insurance premiums, worker's compensation rulings, or any other number of ways that sun exposure can have a financial impact on employers. However, concern for employee well-being should not be dismissed. Employers may wish to pursue multi-component interventions to create the most effective sun protection programs. This could include print messaging, education sessions, email reminders, and even providing free sun protection items to employees. With a variety of sun protection items that employers could choose from (e.g. hats and shirts) these items could be branded by the company to serve in a dual role for both employee health and advertisement. In short, there are a number of ways that employers may approach sun protection, and these findings provide a better idea of how to communicate with employers to encourage their intentions and efforts.

Statements and Declarations - The author reports no conflict of interest. Ethical approval was obtained by the respective institutional review board prior to data collection.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decisions Processes*, 50, 179-211 [http://dx.doi.org/10.1016/0749-5978\(91\)90020-T](http://dx.doi.org/10.1016/0749-5978(91)90020-T)
- American Academy of Dermatology. (2018). *Skin cancer*. Retrieved from <https://www.aad.org/media-resources/stats-and-facts/conditions/skin-cancer>
- Centers for Disease Control and Prevention (2018-a) *Sun safety tips for employers*. Retrieved from https://www.cdc.gov/cancer/skin/basic_info/sun-safety-tips-employers.htm

- Centers for Disease Control and Prevention (2018-b) *United States cancer statistics: Data visualizations*. Retrieved from <https://gis.cdc.gov/Cancer/USCS/DataViz.html>.
- Cheung, J. H., Burns, D. K., Sinclair, R. R., & Sliter, M. (2017). Amazon mechanical turk in organizational psychology: An evaluation and practical recommendations. *Journal of Business and Psychology, 32*(4), 347-361.
- Christian, M. S., Bradley, J. C., Wallace, J. C., & Burke, M. J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology, 94*, 1103-1127.
- Clarke, S. (2006). The relationship between safety climate and safety performance: A meta-analytic review. *Journal of Occupational Health Psychology, 11*, 315-327.
- Clarke, S. (2010). An integrative model of safety climate: Linking psychological climate and work attitudes to individual safety outcomes using meta-analysis. *Journal of Occupational and Organizational Psychology, 83*, 553-578.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Ekwueme, D. U., Guy, G. P., Li, C., Rim, S. H., Parelkar, P., & Chen, S. C. (2011). The health burden and economic costs of cutaneous melanoma mortality by race-ethnicity-United States, 2000 to 2006. *Journal of American Academy of Dermatology 65*(5), 133-143. doi: 10.1016/j.jaad.2011.04.036
- Ellis, A. M., Casey, T. W., & Krauss, A. D. (2017). Setting the foundation for well-being: Evaluation of a supervisor-focused mental health training. *Occupational Health Science, 1*, 67-88.
- Freitas, A. C., Silva, S. A., & Santos, C. M. (2019). Safety training transfer: The role of coworkers, supervisors, safety professionals, and felt responsibility. *Journal of Occupational Health Psychology (24)*1, 92-107.
- Hamilton, K., Kirkpatrick, A., Rebar, A., & Hagger, M. S. (2017). Child sun safety: Application of an integrated behavior change model. *Health Psychology, 36*(9), 916-926.
- Hammond, V., Reeder, A. I., Gray, A. R., & Bell, M. L. (2008). Are workers or their workplaces the key to occupational sun protection? *Health Promotion Journal of Australia, 19*(2), 97-101. Retrieved from <http://search.proquest.com.er.lib.k-state.edu/docview/207433781?accountid=11789>
- Hayes, A. F. (2005). *Statistical methods for communication science* Lawrence Erlbaum Associates Publishers, Mahwah, NJ.
- Heckman, C. J., Handorf, E., Darlow, S. D., Yaroch, A. L., & Raivitch, S. (2017). Refinement of measures to assess psychosocial constructs associated with skin cancer risk and protective behaviors of young adults. *Journal of Behavioral Medicine, 40*(4), 574-582.
- Janda, M., Stoneham, M., Youl, P., Crane, P., C. Sendall, Marguerite, Tenkate, T., & Kimlin, M. (2014). What encourages sun protection among outdoor workers from four industries? *Journal of Occupational Health, 56*(1), 62. Retrieved from <http://search.proquest.com.er.lib.k-state.edu/docview/1520850574?accountid=11789>
- Keith, M. G., Tay, L., & Harms, P. D. (2017). Systems perspective of amazon mechanical turk for organizational research: Review and recommendations. *Frontiers in Psychology, 8*, 19.
- Landers, R. N., & Behrend, T. S. (2015). An inconvenient truth: Arbitrary distinctions between organizational, mechanical turk, and other convenience samples. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 8*(2), 142-164.
- Learn How to Become. (2018). *Get outside! Careers in the great outdoors*. Retrieved from <https://www.learnhowtobecome.org/career-resource-center/outdoor-careers/>
- Leigh, J. P. (2011). Economic burden of occupational injury and illness in the United States. *The Milbank Quarterly, 89*, 728-772.
- Martínez-Córcoles, M., Schöbel, M., Gracia, F.J., Tomás, I., Peiró, J.M., 2012. Linking empowering leadership to safety participation in nuclear power plants: a structural equation model. *Journal of Safety Research, 43*, 215-221.
- Martínez-Córcoles, M., Gracia, F.J., Tomás, I., Peiró, J.M., Schöbel, M., 2013. Empowering team leadership and safety performance in nuclear power plants: a multilevel approach. *Safety Science, 51*, 293-301.
- McCarthy, R. B., Shofer, F. S., & Green-McKenzie, J. (2019). Outcomes of a heat stress awareness program on heat-related illness in municipal outdoor workers. *Journal of Occupational and Environmental Medicine, 61*(9), 724-728.
- McCool, J. P., Reeder, A. I., Robinson, E. M., Petrie, K. J., & Gorman, D. F. (2009). Outdoor workers' perceptions of the risks of excess sun-exposure. *Journal of Occupational Health, 51*(5), 404-411.

- Michel, J. S., O'Neill, S. K., Hartman, P., & Lorys, A. (2018). Amazon's Mechanical Turk as a viable source for organizational and occupational health research. *Occupational Health Science*, 2(1), 83-98.
- Miller, P., & Haslam, C. (2009). Why employers spend money on employee health: Interviews with occupational health and safety professionals from British industry. *Safety Science*, 47(2), 163-169.
- Nahar, V. K., Ford, M. A., Hallam, J. S., Bass, M. A., Hutcheson, A., & Vice, M. A. (2013). Skin cancer knowledge, beliefs, self-efficacy, and preventative behaviors among north Mississippi landscapers. *Dermatology Research and Practice*. 2013, 1-7. <https://doi.org/10.1155/2013/496913>
- Nahar, V. K., Ford, M. A., Boyas, J. F., Brodell, R. T., Hutcheson, A., Davis, R. E., . . . Biviji-sharma, R. (2014). Skin cancer preventative behaviors in state park workers: A pilot study. *Environmental Health and Preventive Medicine*, 19(6), 467-474.
- Occupational Cancer Research Centre. (2017). *Outdoor workers have 3 times greater risk of skin cancer*. Retrieved from <https://www.occupationalcancer.ca/2018/outdoor-workers-have-3-times-greater-risk-of-skin-cancer/>
- Pescud, M., Teal, R., Shilton, T., Slevin, T., Ledger, M., Waterworth, P., & Rosenberg, M. (2015). Employers views on the promotion of workplace health and wellbeing: A qualitative study. *BMC Public Health*, 15. Retrieved from <http://search.proquest.com.er.lib.k-state.edu/docview/1780735152?accountid=11789>
- Peters, C. E., Demers, P. A., Kalia, S., Hystad, P., Villeneuve, P. J., Nicol, A., . . . Koehoorn, M. W. (2016). Occupational exposure to solar ultraviolet radiation and the risk of prostate cancer. *Occupational and Environmental Medicine*, 73(11), 742. doi: 10.1136/oemed-2016-103567
- Schilling, L., Schneider, S., Görig, T., Spengler, M., Greinert, R., Breitbart, E. W., & Diehl, K. (2018). "Lost in the sun"—The key role of perceived workplace support for sun-protective behavior in outdoor workers. *American Journal of Industrial Medicine*, 61(11), 929-938.
- Terrés, F., Castejón, E., & Mondelo, P. R. (2013). Corporate motivation to risk prevention: Applied exploratory analysis in construction sector in catalonia. *Human Factors and Ergonomics in Manufacturing & Service Industries*, 23(3), 173-185.
- United States Department of Labor, OSHA. (2015). OSHA's Safety Pays Program, <https://www.osha.gov/dcsp/smallbusiness/safetypays/estimator.html>
- Van Dongen, J.,M., Tompa, E., Clune, L., Sarnocinska-Hart, A., Bongers, P. M., van Tulder, M.,W., . . . van Wier, M.,F. (2013). Bridging the gap between the economic evaluation literature and daily practice in occupational health: A qualitative study among decision-makers in the healthcare sector. *Implementation Science*, 8(1), 57.
- Volpp, K. G., Troxel, A. B., Pauly, M. V., Glick, H. A., Puig, A., Asch, D. . . . Audrain-McGovern, J. (2009). A randomized, controlled trial of financial incentives for smoking cessation. *The New England Journal of Medicine*, 360(7), 699-709. doi: 10.1056/NEJMsa0806819
- Wangberg, S. C., Nilsen, O., Antypas, K., & Gram, I. T. (2011). Effect of tailoring in an internet-based intervention for smoking cessation: Randomized controlled trial. *Journal of Medical Internet Research*, 13(4), 134-145. doi: 10.2196/jmir.1605
- Webb Hooper, M., Rodríguez, d. Y., & Baker, E. A. (2013). The effect of placebo tailoring on smoking cessation: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 81(5), 800-809. doi: 10.1037/a0032469
- Woolley, T., Lowe, J., Raasch, B., Glasby, M., & Buettner, P. G. (2008). Workplace sun protection policies and employees' sun-related skin damage. *American Journal of Health Behavior*, 32(2), 201-208.
- Yanar, B., Lay, M., & Smith, P. M. (2019). The interplay between supervisor safety support and occupational health and safety vulnerability on work injury. *Safety and Health at Work*, 10(2), 172-179.

Appendix A

Employee Well-Being:

Outdoor workers face many potential dangers on the job, including machinery and busy roads, that can result in serious health risks for employees. One particular danger to employees is the sun's harmful ultraviolet (UV) radiation. Without proper sun protection, these rays can cause numerous health issues, including skin cancer, an increasingly common and deadly disease. Nearly 5 million people are treated for skin cancer each year in the United States, with over 15,000 deaths. As such, sun exposure and skin cancer represent a serious health risk for outdoor workers.

Aside from skin cancer concerns, employees that receive extensive sun damage may experience painful sunburns, premature aging, and long-term eye damage. Each of these medical and physical issues can potentially lead to significant physical and emotional pain among your employees, as well as significantly impacting and worsening their quality of life. Moreover, these health problems can ultimately lead to premature death for your employees. Fortunately, you can reduce your employees' health and wellness risks by using the following sun-safe strategies:

- Encourage sun safety among your employees and provide sun protection when possible. This includes wearing protective clothing, sunglasses, hats, and sunscreen with an SPF of 30 or higher.
- Schedule breaks in the shade and allow workers to reapply sunscreen throughout their shifts.
- Modify the work site by increasing the amount of shade available, for example, with tents, shelters, and cooling stations.
- Create work schedules that minimize sun exposure. For example, schedule outdoor tasks like mowing for early morning instead of noon, and rotate workers to reduce their UV exposure.
- Provide sun-safety information to employees and teach workers about the risks of UV radiation.

Employer Financial:

Outdoor workers face many potential dangers on the job, including machinery and busy roads, that can result in large financial costs for employers. One particularly pricey danger to employers is the sun's harmful ultraviolet (UV) radiation. Without proper sun protection, these rays can cause numerous health issues, including skin cancer, an increasingly common and expensive disease. Nearly 5 million people are treated for skin cancer each year in the United States, at an estimated annual cost of \$8.1 billion. As such, sun exposure and skin cancer represent a serious financial risk for managers and employers of outdoor workers.

Every year, American businesses lose more than \$100 million in productivity because of restricted activity or absence from work due to skin cancer. In some states, employers may be required to provide workers' compensation to employees who get skin cancer because of sun exposure on the job. Additionally, the Occupational Safety and Health Administration (OSHA) requires that employers provide appropriate personal protective equipment to prevent exposure to serious sun exposure hazards. If discovered, violations of OSHA policies can result in expensive fines and financial penalties. Fortunately, you can reduce your company's financial risk by using the following sun-safe strategies:

- Encourage sun safety among your employees and provide sun protection when possible. This includes wearing protective clothing, sunglasses, hats, and sunscreen with an SPF of 30 or higher.
- Schedule breaks in the shade and allow workers to reapply sunscreen throughout their shifts.
- Modify the work site by increasing the amount of shade available, for example, with tents, shelters, and cooling stations.
- Create work schedules that minimize sun exposure. For example, schedule outdoor tasks like mowing for early morning instead of noon, and rotate workers to reduce their UV exposure.
- Provide sun-safety information to employees and teach workers about the risks of UV radiation.

Combined - Employee Well-Being and Employer Financial:

Outdoor workers face many potential dangers on the job, including machinery and busy roads, that can result in serious health risks to employees and large financial costs for employers. One particular danger to employee health and employer finances is the sun's harmful ultraviolet (UV) radiation. Without proper sun protection, these rays can cause numerous health issues, including skin cancer, an increasingly common, deadly, and expensive disease. Nearly 5 million people are treated for skin cancer each year in the United States with over 15,000 deaths. The estimated annual cost of skin cancer treatment is \$8.1 billion. As such, sun exposure and skin cancer represent a serious health and financial risk for both employees and employers.

Aside from skin cancer concerns, employees that receive extensive sun damage may experience painful sunburns, premature aging, and long-term eye damage. Each of these medical and physical issues can potentially lead to significant physical and emotional pain among your employees, as well as significantly impacting and worsening their quality of life. Moreover, these health problems can ultimately lead to premature death for your employees. Additionally, every year, American businesses lose more than \$100 million in productivity because of restricted activity or absence from work due to skin cancer. In some states, employers may be required to provide workers' compensation to employees who get skin cancer because of sun exposure on the job. Further, the Occupational Safety and Health Administration (OSHA) requires that employers provide appropriate personal protective equipment to prevent exposure to serious sun exposure hazards. If discovered, violations of OSHA policies can result in expensive fines and financial penalties. Fortunately, you can reduce your employees' health risks and your company's financial risks by using the following sun-safe strategies:

- Encourage sun safety among your employees and provide sun protection when possible. This includes wearing protective clothing, sunglasses, hats, and sunscreen with an SPF of 30 or higher.
- Schedule breaks in the shade and allow workers to reapply sunscreen throughout their shifts.
- Modify the work site by increasing the amount of shade available, for example, with tents, shelters, and cooling stations.
- Create work schedules that minimize sun exposure. For example, schedule outdoor tasks like mowing for early morning instead of noon, and rotate workers to reduce their UV exposure.
- Provide sun-safety information to employees and teach workers about the risks of UV radiation.

Control:

One alluring aspect of the outdoor industry lies in the sheer volume of jobs available. Despite the economic downturn of the late 2000s, the outdoor recreation economy saw 5 percent growth between 2005 and 2011. A significant component of success for the industry is the ease of entrance. Summer and seasonal jobs are abound for those seeking short-term roles, while individuals looking for permanent, full-time positions also have countless options. Whether you're aspiring to get your hands dirty, walk among the redwoods or live the life aquatic, there are an abundance of job fields that are sure to be of interest.

Whether you dream of being a ski instructor or an archaeologist, surveyor or marine biologist, chances are there is an outdoor career matching your aspirations. With so much variety, those with educational backgrounds ranging from trade schools to doctorate programs can find suitable roles. Use the checklist below to find out if an outdoor job is the right fit for you:

- Do you enjoy being active rather than sitting at a desk?
- Do you value feeling connected to nature?
- Do you appreciate experiencing the changing seasons?
- Can you see yourself in a role that isn't chained to a computer?
- Do you like working with all kinds of people?