SKIN

BRIEF ARTICLE

Community Educational Interventions: An Effective Means to Improve Photoprotection and Skin Cancer Awareness in Outdoor Occupational Workers

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ABSTRACT

Introduction: Outdoor workers are at increased risk for developing skin cancer compared to the general population due to environmental conditions at work sites and riskier behavior regarding skin cancer risk factors. In many populations, sun protection education is associated with increased use of sun protective measures. This study aimed to assess outdoor workers' knowledge of sun safety and evaluate the impact of educational measures on the awareness of photoprotection practices.
Methods: A group of medical students visited construction sites in Birmingham, AL, to deliver 20-minute presentations on the risks of prolonged UV exposure and the prevention of photodamage. Identical 10-question surveys were given to each participant before and after the presentation. Participants rated their level of agreement with statements on photoprotection and skin cancer.
Results: The survey response rate was 79%. Analysis revealed an average pre-presentation score of 3.01 and a post-presentation score of 3.73, on a scale from 1 to 5. Two-sample paired t-tests for each question yielded statistically significant results (p <0.05).
Conclusion: Outdoor occupational workers reported a better understanding of the risks of UV exposure and a greater willingness to engage in sun-protective practices following a brief educational intervention. These findings suggest that community-based education may improve awareness regarding photoprotection and skin cancer risk.

INTRODUCTION

Skin cancer is a preventable, yet leading cause of cancer in the United States. Populations with increased sun exposure, such as outdoor workers, are at an increased risk of skin cancer due to environmental conditions at work sites.[1,2] Research demonstrates that this population receives increased ultraviolet radiation (UVR) exposure than the general population yet has lower rates of sunscreen use.[1,2] Review of the literature on outdoor workers' sun related knowledge, attitudes, and protective behaviors found that photoprotective behaviors are not widely implemented or recognized among outdoor working professionals.[1,2,3,4] Safety education programs have the potential to improve

adherence to sun protection and minimize risky behavior in these individuals.[5]

METHODS

A cross-sectional study was conducted to better understand the attitudes, perceptions, and behaviors of outdoor workers regarding photoprotection and occupational skin cancer risk. The University of Alabama at Birmingham (UAB) Institutional Review Board approved the research protocol to implement educational interventions at ten local construction sites in the Birmingham area. Presentation slides and a 10-item survey were generated through the collaboration of UAB medical students and board-certified dermatologists. Participants completed a 10-item survey prior to a 20-minute interactive lecture, designed to educate participants about skin cancer risk factors and photoprotective strategies. An identical post survey was readministered immediately following the presentation. Survey questions measured how likely participants were to engage in sun protective behaviors or how knowledgeable they were of skin cancer risk factors. Answers were graded on a scale from 1 to 5, with 1 indicating “not at all” and 5 indicating “extremely.”

Among the 210 outdoor workers who attended the presentation, 166 sets of surveys (response rate 79%) were collected. JMP v. 16 was used for statistical analysis. A two-sample paired t-test was performed and yielded statistically significant results ($p<0.05$) across each individual survey question.

RESULTS

The survey response rate was 79%. **Table 1** depicts average response differences for each question before and after the presentation. Positive differences between the pre- and post-surveys indicated the intervention improved attitudes, perceptions, and behaviors of outdoor workers regarding photoprotection and occupational skin cancer risk. Outdoor occupational workers reported a better understanding of the risks of UV exposure and a greater willingness to engage in sun-protective practices following the brief educational intervention. This change in knowledge represents an approximately 14.4% ± 5.8% increase in participant agreement with statements on photoprotection and skin cancer following an educational intervention.

DISCUSSION

The results of our survey-based quality improvement study suggest outdoor occupational workers may benefit from brief educational interventions regarding photoprotection and skin cancer risk. With an average pre-presentation question score of 3.01 and post-presentation score of 3.73, participating individuals reported a better understanding of the risks of UVR exposure, as well as a greater willingness to engage in photoprotective practices, following brief educational intervention. Two-sample paired t-test performed for each of the 10 questions was statistically significant with a $p <0.05$ suggesting community-based education efforts may improve awareness regarding photoprotection and skin cancer risk, and ultimately mitigate behavior. The reproducible results of our, and other such studies, suggest a role for sun safety education in changing the behaviors and attitudes of at-risk individuals toward skin cancer risk.

Table 1. Differences in survey scores before and after a brief educational presentation

Question	Pre-Intervention (mean ± SD)	Post-Intervention (mean ± SD)	p-value (95% CI)
1	3.54 ± 1.20	4.19 ± 1.04	<0.0001* (0.51, 0.88)
2	2.11 ± 1.32	3.16 ± 1.46	<0.0001** (0.82, 1.27)
3	2.60 ± 1.59	3.39 ± 1.40	<0.0001† (0.87, 1.39)
4	2.54 ± 1.46	3.63 ± 1.23	<0.0001* (0.815, 1.273)
5	2.69 ± 1.32	3.64 ± 1.24	<0.0001† (0.73, 1.19)
6	3.61 ± 1.32	4.02 ± 1.23	<0.0001* (0.23, 0.66)
7	3.41 ± 1.30	4.05 ± 1.10	<0.0001† (0.41, 0.86)
8	3.06 ± 1.45	3.99 ± 1.28	<0.0001** (0.69, 1.17)
9	2.92 ± 1.36	3.21 ± 1.54	0.0156** (0.05, 0.54)
10	3.62 ± 1.43	4.04 ± 1.22	0.0003** (0.815, 1.273)

*Indicates N=157. **Indicates N=158. †Indicates N=159
P-values less than 0.05 considered statistically significant.

While these interventions represent a cost-effective means of improving outcomes and reducing morbidity in populations susceptible to developing skin cancer, the attitudes and perceptions of outdoor workers need to be taken into consideration when developing preventative interventions.[1] A qualitative study published by Rocholl et al. in the Journal of Occupational Health sought to better understand these attitudes through problem-centered qualitative interviews with male outdoor workers.[1] Results of this study found a universal underestimation of perceived skin cancer risk and heterogenous attitudes toward photoprotection.[1] While this has been demonstrated in other studies, Rocholl et al. used qualitative interviews to analyze the reasons behind these findings.

The results demonstrated that participants struggled with the feasibility of photoprotection in large part due to their working environment, citing long-sleeved shirts and long trousers were considered problematic.[1] While headgear was commonly worn and sunscreen use was reported, interviewees understanding of proper application, including reapplying, was limited.[1] The importance of these findings is paramount to developing appropriate educational intervention measures that may address individuals' knowledge-gaps related to skin cancer. In order to be effective, educational interventions should be tailored to the individual needs and attitudes of the outdoor workers to best facilitate the implementation of photoprotective measures.

CONCLUSION

The results of our survey-based quality improvement study suggest outdoor occupational workers may significantly benefit from brief educational interventions regarding photoprotection and skin cancer risk. These interventions are easily reproducible and represent a cost-effective means of improving outcomes and reducing mortality in vulnerable populations. A limitation in our study is the assessment of attitudes immediately after administration of the educational program; further research is needed to assess the longitudinal impact of these educational interventions. Future studies may choose to introduce photoprotective measures on worksites and explore the effectiveness of these interventions on the behavior of outdoor workers.

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