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Use of Sunglasses in Public Outdoor Recreation Settings in Honolulu, Hawaii

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Abstract

Purpose—Approximately 20.5 million Americans (17.2%) over age 40 have a cataract in at least one eye, and rates are expected to rise to over 30 million by 2020. Wearing sunglass, especially early in life, may reduce the risk of cataracts. Meanwhile, little is known about the prevalence of wearing sunglasses in the US, especially in areas with high UV radiation. The objective of this study was to assess the prevalence and predictors of wearing sunglasses in public outdoor recreation settings.

Methods—Systematic observations were made at beaches, parks and outdoor public swimming pools in Honolulu, Hawaii on sunny days between November 2005 and June 2007. Observations were conducted independently by two trained observers between 10:00 AM and 4:00 PM. During each observation period each individual in the area was coded for gender, age category, clothing coverage, shade use, and use of sunglasses.

Results—A total of 5,171 people were observed by two independent observers, and the inter-rater reliability use of sunglasses was excellent (Cohen's kappa = 0.83). Overall, 33.0% of people wore sunglasses. Chi Square analysis revealed that significantly more people ($p < .001$) wore sunglasses at swimming pools (35.1%) and parks (34.8%) compared to beaches (30.4%). Adults (41.6%) were more likely to wear sunglasses than children (12.3%; $p < .001$). Gender was not significantly associated ($p = 0.3$) with the use of sunglasses (males = 32.7%; females = 33.3%). Those wearing hats were significantly more likely ($p < .001$) to wear sunglasses (46.6%) than those with bare heads (28.4%).

Conclusions—Direct observation in public outdoor recreation settings reveled that only one third of the population wore sunglasses. Further research should examine the use of sunglasses in other locations and investigate the effectiveness of interventions that promote the wearing of sunglasses in settings with risk for UVR exposure.

Keywords

cataracts; sunglasses; public health; prevention; observations

Approximately 20.5 million Americans (17.2%) over age 40 have a cataract in at least one eye,¹ and rates are expected to rise to over 30 million by 2020.¹ Ultraviolet B (UVB) radiation is an important risk factor for cortical cataract and ozone depletion may further increase the risk of cataracts.^{2,3} Wearing sunglass, especially early in life, may reduce the risk of cataracts.⁴ Meanwhile, little is known about the prevalence of wearing sunglasses in the US, especially in areas with high UV radiation. Hawaii, with a tropical climate and over 7.5 million annual

visitors, is a salient location to study the use of sunglasses. The objective of this study was to assess the prevalence and predictors of wearing sunglasses in public outdoor recreation settings.

METHODS

Systematic observations were made at beaches, parks and outdoor public swimming pools in Honolulu, Hawaii on sunny days between November 2005 and June 2007. Data were collected throughout the year on sunny days. Observations of target areas were conducted independently by two trained observers using previously established methods⁵ during random intervals between 10:00 AM and 4:00 PM. During each observation period each individual in the area was coded for gender, age category (child vs. adult), clothing coverage (hat use, upper and lower body coverage), shade use, and use of sunglasses. Shade use was counted if more than half of a person's body was covered by either environmental shade (i.e. tree or building) or personal shade (i.e. umbrella). All methods were approved by the University of Hawaii Committee on Human Studies. Observer training was conducted using confederates during a simulated observational period. Volunteers were recruited to come to park and beach settings. Their clothing was recorded by the developers of the method and they were told to either stand in the shade or sun and to engage in a variety of activities. These activities included sunbathing, Frisbee playing, soccer and walking. All participants were given a number which was pinned to part of their clothing. A trained cameraman then walked through the zone recording each individual for five seconds. A training video was created from the footage. All study observers viewed the video and coded each participant. Following the viewing they were able to ask any questions of the investigator. Observers were required to get all coding correct before they were allowed into the field. This usually involved watching and coding the video 2-3 times.

RESULTS

A total of 5,171 people were observed simultaneously by two independent observers, and the inter-rater reliability use of sunglasses was excellent (Cohen's kappa = 0.83). Overall, 33.0% of people wore sunglasses when observed. Chi Square analysis revealed that significantly more people ($\chi^2 = 11.5$; $df = 2$; $p < 0.01$) wore sunglasses at swimming pools (35.1%) and parks (34.8%) compared to beaches (30.4%). Adults (41.6%) were more likely to wear sunglasses than children (12.3%; $\chi^2 = 162.2$; $df = 1$; $p < 0.001$). Gender was not significantly associated ($\chi^2 = 11.5$; $df = 2$; $p = 0.3$) with the use of sunglasses (males = 32.7%; females = 33.3%). Those wearing hats were significantly more likely ($\chi^2 = 146.6$; $df = 1$; $p < 0.001$) to wear sunglasses (46.6%) than those with bare heads (28.4%). There were no significant associations ($\chi^2 = 0.46$; $df = 1$; $p = 0.5$) in use of sunglasses between those that were in shaded areas (33.9%) and those who were not (32.8%).

CONCLUSIONS

In this study only one-third of people wore sunglasses, while with only 12% of children wore sunglasses. Childhood is a period of life when individuals are exposed to high levels of UVR and sun protection strategies are encouraged. Nonetheless, consistent with previous research, relatively few children wore sunglasses. In Melbourne, Australia, the overall prevalence of sunglass use was 36.2%, with only 18.9% of 14-20 year olds wearing sunglasses.⁶ This study also found that those wearing hats were more likely to wear sunglasses. This is similar to another study that found that levels of knowledge about the sunlight's effects on the eyes was related to sunglass use.⁷

Public health prevention programs promoting sunglass use especially in young people are needed to reduce the incidence of cataracts. Among those who work outdoors in their 20's the

prevalence of nuclear cataract is 5 times higher than those who work inside. Programs targeted at increasing the use of hats and sunglasses among outdoor workers may be effective in improving these rates.

This study expands on previously reported pilot work that examined sunglass use in one beach setting.⁵ Specifically, this study collected unique observations that coded children and adults separately, added parks and outdoor swimming pools as study sites and collected data throughout the year.

The observation technique used momentary time sampling, which has the potential to over- or underestimate the use of sunglasses as a single 'point-in-time' may not reflect an individual's practices at other times or outside a specific setting. The method does, however, provide a reliable snap-shot of behavior within a defined setting.

Further research should examine the differences in use of sunglasses between beaches and the other settings as well as examine the use of sunglasses in other locations and investigate the effectiveness of methods that promote the wearing of sunglasses in settings with risk for UVR exposure, including the role optometrists could play in promoting the use of sunglasses.

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