A Workplace Intervention for Increasing Outdoor Workers' Use of Solar Protection

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ABSTRACT

Objectives. Outdoor workers are at high risk of developing skin cancer. Primary prevention in this group can potentially reduce the incidence of skin cancer, and also potentiates the spontaneous remission of existing solar keratoses. A randomized controlled trial was conducted to evaluate a solar protection intervention targeting outdoor workers.

Methods. Outdoor workers were randomly allocated to an intervention (n = 65) or control group (n = 77). The intervention group received individual skin screening by a dermatologist and participated in an education session. Pre- and posttest outcome measures included solar protection behavior (assessed using a validated diary), knowledge, and attitudes.

Results. There was a significant increase (16%) in the percentage of outdoor workers who were using a high level of solar protection at posttest compared to pretest in the intervention group, but there was no change in the control group. Although both groups improved in their knowledge score, the intervention group showed a significantly greater improvement at posttest. No changes in attitudes were detected.

Conclusions. The findings suggest that changes in solar protection are achievable with outdoor workers. (*Am J Public Health.* 1994;84:77–81)

Introduction

Skin cancer is the most common form of cancer affecting Australians,[1] and Australia has the highest incidence of skin cancer in the world.[2] In 1987, 20 to 25 Australians per 100 000 were diagnosed as having cutaneous malignant melanoma,[3] and 823 Australians per 100 000 were diagnosed as having nonmelanocytic skin cancers.[4] In Australia, skin cancer results in 1000 deaths each year and has been estimated to cost the community $400 million annually.[5]

Although the burden of illness associated with skin cancer is significant, this disease is estimated to be almost 80% preventable[6] and almost 100% curable by the adoption of a correct and vigilant set of primary and secondary preventive behaviors.[7,8] Primary preventive behaviors, which limit exposure to ultraviolet radiation, not only offer the best prospect of reducing the incidence of skin cancer,[6,9] but also potentiate the spontaneous remission of existing solar keratoses[10] prior to possible malignant transformations.[11] A substantial reduction in the number of solar keratoses has been observed in outdoor workers who were able to reduce their sunlight exposure over a 12-month period.[10] Secondary preventive behaviors, or screening for skin cancers and seeking prompt medical advice, substantially improve the prognosis of existing carcinomas.[12]

There are particular groups, most notably outdoor workers, who are at increased risk of developing skin cancer, given their solar exposure. The work environment for this group intrinsically constitutes a health hazard,[12–14] and it has been found that those working in outdoor occupations are more susceptible to developing nonmelanocytic skin cancers.[15–18] Squamous-cell carcinomas and basal-cell carcinomas are reportedly almost twice as prevalent in long-term outdoor workers than in indoor workers, and outdoor workers are reportedly more than twice as likely to develop solar keratoses.[18] Outdoor workers are also more likely to develop malignant melanomas on parts of their body exposed to sunlight during working hours.[17,19,20] Hence, outdoor workers represent an important target group at risk of developing skin cancer.

While avoidance of sunlight exposure is the ideal,[6,9] such a prevention strategy cannot be exclusively incorporated into the work practices of outdoor employees. This population might, however, beneficially adopt several other primary protective initiatives, such as job planning for maximum utilization of shade areas, particularly around midday, and use of solar protection items such as protective clothing, broad-brimmed hats, sunscreens, and sunglasses. Along with such measures, which are supported by the Australian Council of Trade Unions Occupational Health and Safety Unit,[21] educational and behavioral interventions promoting the adoption of solar protection behaviors are also valued.

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The aim of the present study is to evaluate the effectiveness of a workplace intervention in changing the knowledge, attitudes, and solar protection behaviors of outdoor workers, using a randomized, controlled trial design.

Methods

Procedure and Sample

This study involved outdoor workers from a local electrical supply authority employing approximately 1200 individuals in total. The types of tasks undertaken by these workers, which were generally performed in groups of two to five individuals, included digging trenches; lopping trees; erecting, treating, and maintaining electricity poles; and reading meters door to door.

In this randomized controlled trial, 12 depots containing outdoor workers were randomly allocated to a control or intervention group based on geographic location. This randomization procedure was used to minimize the risk of contamination between the two study groups. Employees were considered ineligible if they spent less than 80% of their day working outside or if they were going to be on leave during the study period. Following random allocation to groups, eligible employees were sent a letter from the chief investigator inviting them to participate in the research.

The effectiveness of the intervention was assessed by comparing pre- and posttest and between-group differences in solar protection behavior, knowledge, and attitudes. The pretest assessment of these variables was made in both groups during the week prior to the intervention. Following pretest measures, the intervention group participated in the intervention, which was conducted over a 1-week period. The posttest measures were collected 1 month following the completion of the pretest data. At pre- and posttest assessments, participants were asked to return their completed measures to the research team in sealed, prepaid, addressed envelopes to ensure confidentiality of information.

Pre- and Posttest Measures

Solar protection behavior diary. Consenting participants were required to complete a solar protection behavior diary for 5 consecutive working days. This diary was developed to gather self-report information about the prevailing weather conditions and about participants' clothing and sunscreen use on different parts of the body. This information allowed a protection score to be calculated for each participant for the 5-day period. The format of the diary was easy to follow, with responses being recorded by circling one of a number of options in each category. To encourage accurate recall, the diary for each day was divided into four 2-hour blocks of time between 7:00 AM and 3:00 PM, and participants were asked to complete each entry as soon as possible after the end of the 2-hour period rather than at the end of the day.

During the pretest phase, the accuracy of self-report by the target group was assessed by direct observation procedures. Both a member of the research team and a safety officer directly observed a proportion of the outdoor workers and completed the items in the diary corresponding to one of the 2-hour time periods. Kappa was used to assess the extent of agreement between the participants' responses and those made by direct observations, with significant kappa achieved in four of the five categories of interest: what was worn on the head ($\kappa = 0.71$, $P < .05$), on the face ($\kappa = 0.42$, $P < .05$), on the shoulders and arms ($\kappa = 0.64$, $P < .05$), and on the legs ($\kappa = 0.89$, $P < .05$). The only category in which disagreement was reported was what was worn on the feet, and this involved reporting whether long or short socks were worn with safety boots ($\kappa = -0.02$, $P > .05$). This difference had no bearing on the calculation of the final protection score. These results, therefore, indicate that the self-report solar protection behavior diary is a valid measure of solar protection behaviors in this target population.

Knowledge and attitudes. A questionnaire developed and previously pilot tested by the research team[22] was used in this study: part 1 comprised 6 items designed to gather information about the subjects' skin type and skin-checking behavior; part 2 consisted of 18 items that assessed knowledge about solar protection and skin cancer issues (maximum score = 23 points, including subitems); and part 3 consisted of 25 items designed to assess attitudes about solar protection and skin cancer. Responses to all items in the questionnaire were recorded by circling the appropriate response options. Details of age and gender were also obtained in the questionnaire, which demonstrated high levels of face and content validity.[23]

Principal components analysis using the statistical package BMDP, program P4M,[24] was used to identify factors from the 25 attitude items. Six subscales were extracted in this analysis, which together accounted for 41.1% of the variance. The four subscales that were internally consistent (Cronbach's alpha > .05[25]) measured participants' attitudes about their personal susceptibility to developing skin cancer (12.8%), risk-taking propensity (8%), perceived benefits of having a suntan (4.8%), and external locus of control (4.6%).

Intervention

The intervention consisted of two components: a skin screening session and an education session.

In the screening session, each participant had his or her skin individually checked by one of five practicing dermatologists. All screening was conducted in privacy, and the dermatologists were asked to rate the condition of the skin on two scales: a 7-point photodamage scale and an 8-point premalignant and malignant damage scale (Table 1). These scales were developed by the dermatologists and specialist surgeons for use in this study, based on evidence that accumulated sun damage to the skin is associated with the development of nonmelanocytic skin cancer.[17,26,27] Before the intervention was begun, a number of meetings were held to discuss the two skin scales and the extent and type of feedback to be given to the subjects. This was done to maximize the consistency among the five dermatologists in their assessment of sun damage and personal risk of the subjects. The dermatologists then informed each participant of his or her current level of skin damage and personal risk of developing more extensive damage and/or skin cancer. Where necessary, the dermatologists also advised the subjects to see their personal general practitioner for management of a lesion or for referral to a specialist for management.

In the education session, the New South Wales Cancer Council's Hunter Region education officer delivered a 30-minute lecture to the participants in groups of approximately 10 to 15 participants. The talk addressed skin cancer in Australia, the increased risk for outdoor workers, and the opportunities for prevention using both measures that are generally available and measures that are specifically issued in this workplace, such as sunglasses, wide-brimmed hats, wide brims and back-flaps for hard hats, sunscreens, long-sleeved shirts, and lightweight overalls. Participants were encouraged to ask questions, and pamphlets supporting the lecture were also distributed.

Participants in the control group were offered the opportunity to take part in the screening and education intervention at the end of the posttest data collection.

Results

Study Sample

Of the initial sample of 127 employees in the intervention group, 14 were not eligible for participation in the study, 17 did not return any of the pretest data, and 10 completed only part of the pretest, leaving 86 employees with complete pretest data. A complete data set suitable for analysis of all variables was available for 65 (76%) of these individuals (64 men, 1 woman; mean age = 40.6 years, range = 22 to 63 years).

Of the initial sample of 136 outdoor employees in the control group, 5 were not eligible for participation in the study, 20 did not return any of the pretest data, and 13 completed only part of the pretest data, leaving 98 employees with complete pretest data. A complete data set suitable for analysis of all variables was available for 77 (79%) of these individuals (all men; mean age = 40.4 years, range = 23 to 61 years).

Analyses were conducted to assess whether there were any differences in baseline variables between participants who had completed only part of the study (e.g., pretest data only) versus those who had completed all parts. These comparisons revealed no significant differences in age (P = .124), baseline knowledge (P = .395), and baseline solar protection score (P = .149).

Photodamage and Premalignant and Malignant Damage

A test for trend was conducted on the control and intervention groups' results and indicated that the two groups did not differ from the linear trend on either the photodamage scale (P = .444) or the premalignant and malignant damage scale (P = .571). Given the small sample in a number of the cells, grades 4 to 6 were collapsed in the photodamage scale and grades 3 to 7 were collapsed in the premalignant and malignant damage scale, prior to conducting the test for trend. The proportions of outdoor workers with different levels of damage on the two scales are presented in Table 1. The two scales were found to be significantly correlated (r = 0.57, P = .0001), indicating a positive relationship between the degree of photodamage and premalignant/malignant change in the skin.

TABLE 1—Proportion of Outdoor Workers with Different Grades of Photodamage and of Premalignant and Malignant Damage to Skin

Grade of Damage	Outdoor Workers, %: Intervention Group (n = 86)	Outdoor Workers, %: Control Group (n = 98)
Photodamage		
0 None	7.48	2.91
1 Minimal macular hyperpigmentation and fine wrinkling	22.43	18.45
2 Pigmentary changes more marked in association with mild yellowing and thickening and mild coarse wrinkling	31.78	39.81
3 Both hyper- and hypopigmentation with moderate degree of yellowing, coarse wrinkling, and fine wrinkling in one area	15.89	14.56
4 Involvements of more than one area to a grade of 3	16.82	23.30
5 Severe pigmentary change, laxity, fine and coarse wrinkling in one area	1.87	0.00
6 Changes of grade 5 in all areas	3.74	0.97
Premalignant and malignant damage		
0 None	42.99	30.10
1 Presence (or history of previous treatment) of solar keratosis in one area only	26.17	31.07
2 Presence (or history of previous treatment) of solar keratoses in two areas	16.82	21.36
3 BCCs but no solar keratoses	0.00	0.00
4 Presence (or history of previous treatment) of BCCs or SCCs as well as of solar keratoses	11.21	16.50
5 Severe dysplastic change (to include solar keratoses, BCCs, SCCs, or Bowen's disease) in one area	1.87	0.97
6 Total dysplastic change in one area	0.00	0.00
7 Total dysplastic change in all areas	0.00	0.00

Note. BCC = basal-cell carcinoma; SCC = squamous-cell carcinoma.

Solar Protection Behavior

A protection score was calculated for every opportunity available for protection. An opportunity was defined as the worker's being outdoors between 11:00 AM and 3:00 PM when there was no rain. Protection level was calculated by giving each participant an aggregate score for the use of solar protection measures on each of nine body regions. A body region was considered to be adequately protected if it was fully covered by clothing/hat or shaded at the time of the interview, and/or if sunscreen lotion with a sun protection factor of 15 or higher had been applied to that region, as recommended by Australian Cancer Councils.

The points assigned to each body region were weighted to reflect the comparative risk, as indicated in the literature, of that region developing melanoma or skin cancer.[13,28-30] Thus, the face, back, and legs were appointed a maximum protection score of 3 points each, the shoulders and upper arms were appointed a maximum protection score of 2 points each, and the remaining body areas (neck, lower arms, chest, and stomach) were appointed a maximum protection score of 1 point each. Using this relative weighting scale, participants' overall protection level was scored out of a possible maximum of 17 points. Participants who scored 13 or more points (>75% of the body protected) were classified as having high protection during the period of diary completion. This cutoff point was selected to ensure consistency with previous research.[31]

Using this definition, z scores[32] used to make between-group comparisons indicated no baseline difference between the two groups in the percentage of workers protected (intervention = 50%, control = 49%; P = .904) but a significant difference at posttest (intervention = 66%, control = 49%; P = .042), with a greater proportion of outdoor workers in the intervention group having high solar protection. McNemar's test[32] was used to assess the change in protection from pretest to posttest in each group. As Figure 1 illustrates,

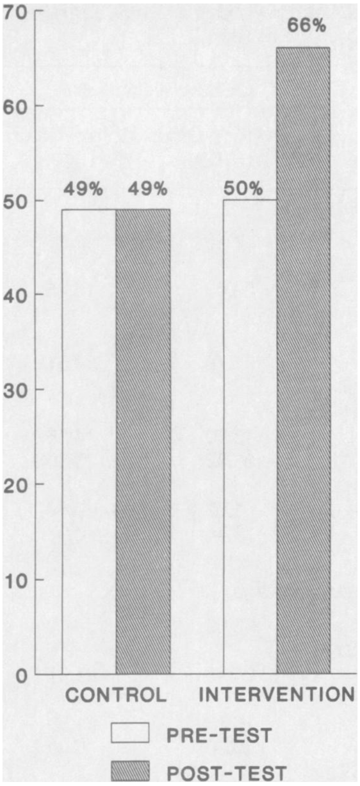

FIGURE 1—The proportion of outdoor workers (control vs intervention groups) using a high level of solar protection during the pre- and posttest periods.

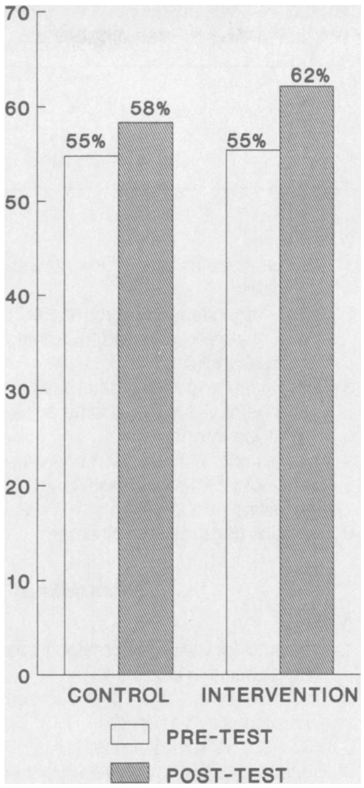

FIGURE 2—The percentage of correct knowledge score (control vs intervention groups) at the pre- and posttest periods.

the proportion of outdoor workers who used high solar protection increased significantly from pre- to posttest in the intervention group ($P < .02$) but did not change in the control group ($P = 1.0$).

Knowledge and Attitudes

A knowledge score was obtained for each group by calculating the average percentage of correct responses from a maximum of 23 points. Between-group knowledge was compared using t tests, and within-group knowledge was compared using paired t tests. As illustrated in Figure 2, there was no significant difference between the two groups at baseline (intervention = 55%, control = 55%; $P = .774$). While both groups demonstrated a significant improvement in the average percentage of correct knowledge score from pretest to posttest (intervention = $P < .001$; control = $P < .01$), the level at posttest was significantly higher in the intervention group (62% vs 58%, $P < .05$).

An attitude score was calculated by using the factor scores from each of the internally consistent factors, with the most desirable response receiving the maximum score (100%). There were no differences between the two groups either at baseline (intervention = 50%, control = 49%; $P = .567$) or at posttest (intervention = 49%, control = 48%; $P = .449$), and no changes were observed in either group from pretest to posttest.

Discussion

Although outdoor workers are at increased risk of developing skin cancer because of the nature of their occupation,[12–14] no evaluated health promotion activities directly targeting this health problem have been reported in the workplace. The primary aim of this study was to develop and evaluate the effectiveness of a workplace intervention program designed to improve the solar protection behavior and related knowledge and attitudes of a sample of outdoor workers in the Hunter Region.

The results revealed a significant improvement in both the knowledge and the solar protection behavior of the workers who participated in the intervention. This was indicated by an increase of 16% from pre- to posttest in the proportion of workers in the intervention group who used high solar protection, compared with no improvement in overall protection of workers in the control group. Knowledge about skin cancer and solar protection issues was also assessed in this study, and although both groups improved in their average knowledge score, the improvement was significantly greater in the intervention group. Neither group showed any change in their attitudes about skin cancer and solar protection.

The success of this intervention in improving the knowledge and solar protection behavior of the target group may be attributed to a combination of factors. First, the delivery of the intervention through the workplace may have contributed to its success, as previously discussed.[33–38] Given that exposure to the sun is an inherent part of the work environment of outdoor workers, attempts to change the workers' solar protection behavior at the work site are likely to be more successful than less environmentally specific interventions, as supported by the results of this study.

Second, the education session complemented the screening session by providing specific information on the means of modifying the health risk behavior (i.e., solar exposure), thereby addressing personal vulnerability to developing skin cancer. Such information included the opportunities to prevent skin cancer by using both measures that are generally available and measures that are specifically issued in this workplace, such as sunglasses, wide-brimmed hats, wide brims and backflaps for hard hats, sunscreens, long-sleeved shirts, and lightweight overalls. Furthermore, distribution of written information could encourage social support from other members of an individual's household, thereby providing an additional motivation to change.

In conclusion, although the intervention developed and evaluated in this controlled trial was associated with an improvement in both the level of knowledge and the proportion of workers adequately protected, a number of issues need to be addressed in future research. First, the proportion of protected outdoor workers improved 16% after participation in the intervention. While this result may not appear to be substantial, it was achieved by implementing a relatively brief intervention, which consisted of one screening/education session. Since the overall level of protected outdoor workers remains suboptimal in this group (66%), the potential for achieving greater improvements needs to be examined in future programs. Furthermore, research is required to develop and evaluate interventions that may have a lasting effect on the solar protection of the vulnerable target group.

Second, although the intervention was effective, further programs specifically targeting outdoor workers should be developed and systematically evaluated to assess the relative cost-effectiveness of simple versus more intensive interventions. Ideally, programs incorporating screening should use existing resources within the workplace, such as occupational health and safety officers, whose job description clearly encompasses such health promotion activities. The response of both employees and management in our research suggests that such programs would be well supported.

Finally, while this program focused specifically on individual behavioral change, it is important that the issue of solar protection for outdoor workers be considered on multiple levels. These may include providing educational sessions; adopting and enforcing workplace policies that address protection and screening; providing adequate solar protection items, including lightweight overalls, hats, and sunscreen; providing structural shelters, such as umbrellas or canopies; and restructuring outdoor work to avoid the most harmful period of the day. Each option is associated with some financial as well as administrative costs to the workplace, so the likelihood of a workplace adopting one or a number of these options will depend on available resources and the perceived priority of skin cancer in relation to other workplace health promotion and occupational health and safety issues. However, the long-term benefits in reducing the burden of illness of skin cancer are likely to be substantial. □

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References

1. Armstrong BK. The epidemiology and prevention of cancer in Australia. *Aust N Z J Surg.* 1988;58:179–187.
2. Marks R. Non-melanotic skin cancer and solar keratoses: the quiet 20th-century epidemic. *Int J Dermatol.* 1987;19:1045–1052.
3. Giles GG. *Mortality Rates in Australia 1985–1987.* Melbourne, Australia: Anti-Cancer Council of Victoria; 1989.
4. Giles GG, Marks R, Foley P. Incidence of non-melanotic skin cancer treated in Australia. *Br Med J.* 1988;296:13–19.
5. McCarthy WH, Shaw HM. Skin cancer in Australia. *Med J Aust.* 1989;150:469–470.
6. Stern RS, Weinstein MC, Baker SG. Risk reduction for non-melanoma skin cancer with childhood sunscreen use. *Arch Dermatol.* 1986;122:537–545.
7. Evans JF, Miller OF. Malignant melanoma and its precursors. *Postgrad Med.* 1986; 79(2):215–222.
8. Breslow A. Thickness, cross-sectional areas and depth of invasion in the prognosis of cutaneous melanoma. *Ann Surg.* 1970; 172:902–908.
9. Watson A. Sunscreen effectiveness: theoretical and practical considerations. *Aust J Dermatol.* 1983;24:17–22.
10. Marks R, Foley P, Goodman G, Hage BH, Selwood TS. Spontaneous remission of solar keratoses: the case for conservative management. *Br J Dermatol.* 1986;115: 649–655.
11. Bendl BJ, Graham JH. New concepts on the origin of squamous cell carcinomas of the skin: solar (senile) keratosis with squamous cell carcinoma—a clinicopathologic and histochemical study. *Proc Natl Cancer Conf.* 1971;6:471–480.
12. Sober AJ. Solar exposure in the aetiology of cutaneous melanoma. *Photodermatol.* 1987;4:21–23.
13. White AD. The use of sunscreens in Australia. *J Clin Med.* 1990;33(1):27–39.
14. Fitzpatrick TB, Sober AJ. Sunlight and skin cancer. *N Engl J Med.* 1985;313:818–819.
15. Marks R, Ponsford MW, Selwood TS, Goodman G, Mason G. Non-melanocytic skin cancer and solar keratoses in Victoria. *Med J Aust.* 1983;2:618–622.
16. Marks R, Selwood TS. Solar keratoses: the association with erythemal ultraviolet radiation in Australia. *Cancer.* 1985;56:2332–2336.
17. Beral V, Robinson N. The relationship of malignant melanoma, basal and squamous cell cancers to indoor and outdoor work. *Br J Cancer.* 1981;44:886–891.
18. Green A, Beardmore G, Hart V, et al. Skin cancer in a Queensland population. *J Am Acad Dermatol.* 1988;19:1045–1052.
19. Vagero D, Ringback G, Kiviranta H. Melanoma and other tumors of the skin among office, indoor and outdoor workers in Sweden. *Br J Cancer.* 1986;53:507–512.
20. Holman CDJ, Armstrong BK, Heenam PJ, et al. The causes of malignant melanoma: results from the West Australian Lions melanoma research project. In: Gallagher RP, ed. *Epidemiology of Malignant Melanoma.* Heidelberg, Germany: Springer Verlag; 1980.
21. ACTU Occupational Health and Safety Standard. In: Holmes N, Berger Y, eds. *Health and Safety Bulletin,* no. 61. Victoria, Australia: Australian Council of Trade Unions; 1989.
22. Foot G, Girgis A, Boyle K, Sanson-Fisher RW. Solar protection and related beliefs: a study of beachgoers. *Aust J Public Health.* 1993;17:209–214.
23. Bennett AE, Ritchie K. *Questionnaires in Medicine: A Guide to Their Design and Use.* London, England: Oxford University Press; 1975.
24. Dixon WJ. *BMDP Statistical Software.* Los Angeles, Calif: University of California Press; 1985.
25. Cronbach L. Coefficient alpha and the internal structure of tests. *Psychometrica.* 1951;16:297–334.
26. Johnson BE. Solar radiation and skin cancer. *Br J Cancer.* 1973;28:91.
27. Holman CDJ, Armstrong BK, Evans PR, et al. Relationship of solar keratosis and history of skin cancer to objective measures of actinic skin damage. *Br J Dermatol.* 1984;110:129–138.
28. Balch CM, Soong SJ. Characteristics of melanoma that predict the risk of metastases. In: Costanzi JJ, ed. *Malignant Melanoma. Cancer Treatment and Research 9.* The Hague, the Netherlands: Martinus Nijhoff; 1983.
29. Giles C, Lecatsas S, Jolley D, Silver B. Trends in skin cancer in Victoria. *Trans Menzies Found.* 1989;15:153–155.
30. Ring IT, Walker SM, Firman D, et al. Melanoma in Queensland. *Trans Menzies Found.* 1989;15:157–163.
31. Girgis A, Sanson-Fisher RW, Tripodi AD, Golding T. Evaluation of interventions to promote solar protection in primary schools. *Health Educ Q.* 1993;20:275–288.
32. Bland M. *An Introduction to Medical Statistics.* Oxford, England: Oxford University Press; 1987.
33. Conrad P. Health and fitness at work: a participant's perspective. *Soc Sci Med.* 1988;26:545–550.
34. Zavella K, Davis L, Cottrell R, Smith W. Do only the healthy intend to participate in worksite health promotion? *Health Educ Q.* 1988;15:259–267.
35. Roman PM, Blum TC. Formal intervention in employee health: comparisons of the nature and structure of employee assistance programs and health promotion programs. *Soc Sci Med.* 1988;26:503–514.
36. Hollander RB, Lengerman JJ. Corporate characteristics and worksite health promotion programs: survey findings from Fortune 500 companies. *Soc Sci Med.* 1988; 26:491–501.
37. Taylor SE. *Health Psychology.* New York, NY: Random House; 1986.
38. Stachnik TJ, Stoffelmayr BE. Is there a future for smoking cessation programs? *J Health Educ.* 1982;7:47–56.