Promoting sun safety in the workplace — what works?

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Abstract

Objective: Australia has one of the highest skin cancer incidence and mortality rates in the world. Outdoor workers are a high risk group. Australian workplaces are undergoing large scale safety-related changes, yet the mandate to provide specific sun safe practices remains absent. With much of the previous research aiming to improve sun safety in the workplace being quantitative in nature, relatively little is known about why certain sun safe strategies will or will not be successful in workplaces.

Methods: This qualitative article explores the enablers and barriers identified during an 18-month mixed methods project conducted in Queensland, Australia which aimed to improve workplace sun safe interventions.

Results: A variety of key enablers and barriers to implementing sun safe interventions in the workplace were identified, including presence of an engaged workplace champion, ownership and innovation by the workers.

Conclusions: These findings were part of a broader integration of interlinked qualitative and quantitative methods to yield a more complete picture of the determinants of the issue, implementation process and likelihood of changes at the workplace.

Implications: The paper provides guidance for public and occupational health practitioners on the selection of the most promising strategies when assisting workplaces to become sun safe.

Keywords: sun safety, skin cancer, outdoor workers, workplace.

Introduction

Australia has one of the highest skin cancer incidence and mortality rates in the world. Despite the large amount of daily sun to which outdoor workers are exposed, studies of outdoor workers show some are taking precautions but a substantial number remain exposed to the sun without adequate protection. Evidence-based data confirming the effectiveness of sun protective strategies in the workplace are scarce. General recommendations are mainly based on the avoidance of ultraviolet radiation (UVR), which has been
identified as potential risk factor for non-melanoma skin cancer in epidemiological studies.\(^3\) Adding another layer of complexity to this issue is the historical lack of specific legislation to mandate sun safety in the workplace. Previous research aiming to improve sun safety in the workplace has predominantly used quantitative methods,\(^2\) and relatively little is known about what strategies may be successful in certain workplaces and why. There is little guidance for health promotion practitioners on how to select the most promising strategies when assisting workplaces to become sun safe.

This project involved an 18-month mixed methods study of 14 workplaces in Queensland, Australia with a predominantly outdoor workforce. The aim was to develop and implement a sun protection program tailored to each workplace. This paper describes the qualitative results, and particularly the identified key enablers and barriers to implementing sun safe interventions in the workplace. These results highlight the complexity surrounding the promotion and implementation of sun safe practices at workplaces in a high ultraviolet radiation (UVR) exposure environment.

Methods

This study aimed to identify and demonstrate the effectiveness of sun protection measures which influenced high risk outdoor workers in Queensland to adopt sun safe behaviour practices.

Fourteen workplaces across Queensland were recruited. These workplaces included small and large businesses across the rural, building and construction, public and local government sectors. The recruited workplaces were located in Far North, North West, Darling Downs and Mackay regions of Queensland and all employed outdoor workers. Queensland is a tropical state, where the vast majority of the land surface receives an average of between eight and nine hours of sunshine each day. The definition of an outdoor worker was agreed to be an individual who worked outdoors most of the day, but for at least three hours daily for five days a week.

This study employed a mixed methods research methodology involving a repeated cross-sectional (pre- and post-intervention) quantitative design paired with a participatory action research (PAR) design, underpinned by health promotion principles and case study methodology.\(^5\) \(^6\) This integration of a series of interlinked qualitative and quantitative methods enabled researchers to yield a more complete picture of the issue of sun safety strategies for outdoor workers. Selecting mixed methods provided the research team with the flexibility necessary to investigate previously recognised and emergent aspects of this complex topic. This was particularly important given the diversity of the recruited workplaces, the inability to compare directly across them and the need to focus on both workers and workplace representatives and management (rather than just research processes) throughout the project.

The qualitative strategies used in this research project included pre- and post-policy analysis, employee and employer consultation and workplace observations. The quantitative methods included employee survey research and UVR measurement through dosimeters, and quantitative results are published elsewhere.\(^7\) This paper focuses on reporting the qualitative methods and findings of the project.

The qualitative aspect of the project was underpinned by the PAR approach. The use of PAR was in itself an enabling factor for the project, as the process allowed the establishment of solid and trustworthy partnerships with each workplace. PAR involves a focused, “heads together” way of thinking and values people’s inputs, taking advantage of existing skills and resources and stimulating innovation.\(^8\) The use of PAR encouraged processes which stimulated “new” ideas and different ways of doing things as identified by those most affected — the outdoor workers and workplace managers. Further, in undertaking the inquiry process across 14 distinct sites simultaneously this study employed a multi-site action research approach.\(^9\)

This was achieved through extensive and sustained employer and employer consultation both on-site and electronically. Each workplace was assigned a designated researcher to ensure continuity of support, advice and trust.

Qualitative data were collected in the pre-intervention phase using a number of strategies, including interviews with workplace champions and discussion groups with workers.

Interview data were collected via the workplace champion using tools developed to identify the existing context of sun safety in each workplace. Situational Analysis A was a tool designed to develop rapport with
and seek formal approval for participation from each workplace; to establish a baseline context by collecting quantitative and qualitative data about workplace demographics, locations and structures; and to identify existing workplace policies and procedures related to sun safety and UVR and workers’ compensation histories. Situational Analysis B was a more comprehensive tool designed to systematically collect data about workplace sun safety policies and procedures, sun safety risk assessments, personal protective equipment (PPE), structural and environmental sun safety strategies, sun safe education, skin examination and sun safety role modelling. Situational Analysis A was conducted over the telephone with the workplace champion, and Situational Analysis B was conducted face-to-face.

Data were also collected from workers via discussion groups pre-organised through the workplace champion. These discussion groups were semi-structured, and designed to obtain workers’ views about how sun safety in the workplace could be improved. The discussion groups facilitated the expression of ideas, valued the workers’ existing skills and knowledge and stimulated group thinking.

Following the initial face-to-face interviews and discussions a tailored sun safety action plan was negotiated with each workplace, informed by both the literature and employee and employer contributions. A key philosophy of this project was the participatory and collaborative nature of planning between each workplace and the research team. When developing the action plans, the research team also developed “theories” about what and why certain strategies were enabled or inhibited at each workplace. These theories were explored during the intervention, providing an empirical basis for eliciting enablers and barriers.

At the completion of the 18-month intervention, a post-policy analysis was conducted and compared with the pre-intervention policy analysis allowing changes in organisational policy to be identified. This again involved the use of a number of key qualitative data collection strategies. Situational Analysis C — a tool designed to identify changes in sun safety strategies which occurred during the intervention phase for each workplace — was conducted with the workplace champion in both telephone and face-to-face format. Further, discussion groups were conducted with workers to gather information from workers about their perceptions of changes in sun safety strategies which occurred during the intervention phase.

The data gained through this mixed methods research process contributed to the development of a case study for each workplace. This case study documented the enablers and inhibitors associated with producing sustainable changes in the sun safety practices of both the workers and organisations. These enablers and inhibitors are presented following.

**Limitations**

There are some limitations to the methodological approach used in this research. As the sample of workers was convenient and relatively small, results may be limited in terms of their generalisability. Also, as the qualitative data was hand-coded, there may have been inconsistencies or minor errors between the results obtained by different members of the research team.

**Results**

The most common enablers and barriers identified during this project are described separately for clarity in the following sections, however, often overlapped and interacted in practice. Essentially, there are a number of factors which need to occur simultaneously for workplaces to successfully integrate sun safety changes. These key enablers included a pro-active workplace champion, employee engagement, endorsement by senior management, role modelling and access to appropriate resources.

**Enablers**

**Workplace champion**

It was identified that a workplace champion is a critical driver of any success or change in sun safety in small and large workplaces. However, in the present study it was found that these champions had limited quarantined time to dedicate to sun safety, and many did not possess the expertise in sun safety or skin cancer prevention necessary to drive sustainable change. Thus, additional support and advice for workplace champions was required to ensure implementation of the sun safety action plans.
Several characteristics of the workplace champion made it more likely that the workplace’s sun protection action plan was progressed smoothly and efficiently. These included:

a) The workplace champion was more successful if they were a trusted and well-respected person within the workplace, and were seen as a good mediator or negotiator who had the capacity to communicate effectively with both the workers and the higher level management.

b) The workplace champion who utilised a very active management approach more successfully integrated sun safety into the workflow and encouraged innovation and contribution from workers and management.

c) The workplace champion was most effective when they had the power to execute decisions to initiate new or progress existing sun-safe practices within the workplace.

d) Several workplace champions created a high level of personal expectation from the workers to behave in a sun safe way and acted as exemplary role models, even if the respective behaviour was not an explicit part of a workplace policy.

The project recommends an organisational workplace champion for sun safety be appointed to guide and sustain action in workplaces. Given the scarcity of resources in many workplaces, it is suggested that championing would not necessarily be a full-time role, but rather involve more of a reinforcing function to ensure sun safety is continually placed on the workplace safety agenda communicated to staff in a manner that is engaging and meaningful. An alternative solution for larger workplaces is the provision a formalised sun safety training program for all existing workplace health and safety professionals to ensure sun safety is considered as seriously as other workplace hazards.

**Personal experience with skin cancer**

Personal experience with skin cancer is directly related to the willingness of workplaces to participate in and promote sun safety behaviour. For example, one champion in a small construction workplace had survived a melanoma, and this triggered their involvement in the project. Going beyond personal experience, and even if they had not themselves been touched by skin cancer, several workplace champions used a “personalisation approach” to make sun safety more relevant to workers by telling personal stories, or asking workers who showed a particular interest in sun safety to engage with those less interested.

In some workplaces, employees who had experienced skin cancer appeared to adopt a sense of responsibility for sun safety and became informal champions at the employee level. These individuals exhibited excellent peer mentorship strategies and encouraged others to adopt and sustain sun protective behaviours.

**Culture and management structure of the workplace**

In this study, several of the smaller workplaces with very flat hierarchies found it relatively easy to mutually agree on, ratify and implement a sun safety action plan. Workers themselves were closely involved in many of these processes. The personal relationships that frequently characterised these smaller workplaces enabled instant and timely decision making and execution of workplace change. Additionally, this workplace change rarely required written permission, reducing time lag.

**Highly visible resources**

In this study, larger workplaces in particular praised the availability of highly visual and relevant resources including posters, pamphlets and DVDs, and embraced such resources. Having multiple resources allowed workplaces to rotate these to ensure the sun safety message was continually fresh. Resources which contained bright colours and were easy to understand — for example, using symbols rather than text — were favoured. Several gaps in resources were identified, including the provision of resources for those with low literacy levels and resources specific to the outdoor worker context. Existing resources may need some adaptation to be most relevant for a particular work context.

**Employee participation**

Researchers recognised the two major challenges to the success of programs were achieving high participation rates and maintaining behaviour change over time. To cater for these challenges, the planning
stages of the intervention ensured employees had the opportunity to contribute to the development of a
sun safety plan relevant to their industry, work tasks and setting. The workers, workplace champion and
management were engaged in discussing solutions and agreeing on the best steps forward to ensure a sun
safe workplace. This participatory process was more effective in smaller workplaces, as larger workplaces
often had dispatched teams working in remote locations. Workplaces which used strong engagement
facilitated a process where workers felt ownership over the sun safety action plan and were therefore more
likely to adhere to the recommended actions.

This project recommends workplaces be encouraged to adopt a participatory process between management
and employees when discussing and developing sun safety plans for individual workplaces, and to value
employee engagement in identifying potential solutions to challenging sun safety issues, including how an
existing evidence-based strategy might need to be implemented in a particular work context.

Role modelling

This project identified that sun safe clothing was more readily accepted by outdoor workers if one employee
was willing to introduce sun safety practices and sustain them over time. The role models in this project
were diverse in nature and included managers, administrative personnel and general staff. In some of
the smaller workplaces, female employees were considered effective role models due to their “nurturing”
nature and ability to convey clear sun safe messages. In one large rural workplace, an older indigenous
employee successfully served as a role model for sun safety as he related to young men with lower risk
perception by wearing sun safe protective clothing, telling stories and using anecdotes. During the research,
a video was made of this indigenous worker explaining the importance of sun safety practices and this was
incorporated into the sun safety training provided to employees. Site supervisors, although not the formal
workplace champion, were often the instigators of sun safe behaviour, ensuring employees sought shade
where possible and consumed adequate amounts of water.

Innovation

By working together in smaller groups and brainstorming relevant sun safe strategies, several of the
workplaces developed innovative sun safe solutions. This reinforced the value of participatory processes
where employees were encouraged to provide potential solutions to complex problems. In this project,
employees were provided the opportunity to take ownership of the sun safety solutions and be very engaged
and creative in doing so. Many of these innovations were low-cost and could be used repeatedly in the
workplace setting. One example was the development of a stainless steel attachment for a work truck to
permanently hold sunscreen. This solved the problem of employees forgetting to bring or constantly losing
sunscreen on the job. Another workplace could not find suitable shade covers due to the high mobility of
their work and the custom design of machinery. Liaison with local engineering firms and the use of on-site
expertise enabled the creation and manufacture of shade structures which could be mounted from tractors
and saw the erection of permanent shade structures over water and fuelling pumps.

Ability to combine heat stress with sun protection

In high risk workplaces such as construction, this study illustrates that workplaces can benefit by integrating
sun safe messages into their existing injury prevention and/or heat stress agendas and procedures. It was
noted that many workplaces referred to the issue of heat stress and its prevention — which often requires the
same protection methods as sun safety (ie seeking shade, scheduling work, drinking sufficient water) — with
greater ease than skin cancer prevention. The more immediate consequences of heat stress made it easier
for people to understand the need to take immediate action, compared with the longer-term effects of sun
safety on skin health.

Small successes and sustaining the momentum

Several workplaces were initially hesitant to commence implementation of their action plan or move
systematically through the various aims they had set themselves, feeling overwhelmed by the required
workload. Despite this, a number of workplaces — and particularly those which identified and celebrated
small successes — re-engaged in the more strategic sun safe processes and sought the relevant assistance
or approval to perform subsequent strategies within their sun safety action plan. As an example, one
workplace introduced a new type of broad brimmed hats and was surprised by the very positive response and enthusiastic acceptance of the workers and management. It was then easier for that workplace to start discussion about work scheduling and other more difficult strategies.

**Barriers**

**Lack of clear legislative mandate**

The implementation of this project was influenced by Queensland occupational health and safety legislative instruments as there was no formal framework to facilitate sun protective behaviour in workplaces. In general, sun safety is not considered a workplace hazard across all relevant sectors (eg construction, agriculture, forestry and fishing, diving and snorkelling). The general obligation of care tends to centre on workplace safety issues, particularly risks that have an immediate impact such as slips, trips or falls.

This project recommends inclusion within the existing construction work methods statements of generic wording to address the UV radiation risk to outdoor workers. It further recommends work method statements, complete with the UV radiation generic wording, be considered and adopted by workplaces in all sectors.

This project also recommends the prevention of skin cancer be considered as a high risk, long-term hazard for outdoor workers, and therefore be included within existing Safe Work Australia documents such as a Code of Practice (ie “Managing the Work Environment and Facilities Code of Practice”).

**Over reliance on Personal Protective Equipment (PPE)**

There was a high level of reliance on PPE as a control measure during the project. The pre-intervention policy analysis identified that prior to support from the project team, many of the workplaces considered they were fully meeting their obligation of care by providing PPE. PPE provision was a common strategy due to ease of availability, cost effectiveness and ability to enforce its use. However, consistent with the hierarchy of control, the provision of PPE alone is the least effective control measure. Greater workplace support and innovation was required to develop more appropriate and sustainable solutions, including work rescheduling or shade structures, highlighting the need for ongoing support to ensure a comprehensive approach to sun safety.

This project recommends comprehensive sun safety efforts be continued even if PPE has been provided. This recommendation reinforces that PPE should continue to be promoted as the least-desirable control measure, with structural and environmental changes being paramount due to their sustainability.

**Lack of specific resources targeting outdoor workers**

Although access to a variety of resources was an enabling factor, the lack of outdoor worker-specific resources was identified as a barrier. There is a lack of highly visual resources featuring outdoor workers in various relevant roles (eg roofers, concreters and farmers, etc). The limited availability of suitable resources was overcome by self-created materials by some workplaces within the project, again highlighting the enabling features of the PAR process. One example was the development of a sticker which included the words “Be SunSafe” and the National sun safety icons. Workplaces were encouraged to place this sticker in key areas including on the dash of work vehicles and machinery, doors to exit outdoors and on hard hats.

The development of workplace specific resources designed in conjunction with a group of outdoor workers was recommended to target this high risk group.

**Timing of changes**

The complexity of timing for sun safe outcomes was experienced in two ways during the project. In some workplaces, the lag time between implementing sun safety strategies and changes in sun safe behaviour could sometimes seem extremely long, particularly in a small workplace, thereby creating apathy and disengagement.

In other workplaces, the long latency period of skin cancer was considered to be a barrier to changing workplace culture. Workers perceived there were no immediate health benefits to sun safety other than avoiding sunburn.
Outdoor worker perceptions and values

This study found the Australian outdoor worker culture hindered sun safe behaviours. In some cases, it was difficult to get the younger employees to be sun safe because — quoting workplace managers — they wanted to look “buffed and brown” or had the perception that “skin cancer was not going to happen to them”. In other workplaces, it was the older workers who were not sun safe, with many stating “they are too old to start applying sunscreen now — the damage has been done”.

Overcoming perceptions and habits such as these needs to be a long-term goal of any skin cancer prevention program. For workplace interventions, these critical beliefs — which guide people’s sun-protective practices — must be acknowledged and addressed in tailored workplace plans.

Mixed health messages

Several of the workers commented on mixed messages for sun safety on various occasions. One mixed message was related to vitamin D and media reports that many people in Australia are vitamin D deficient. The mixed messages about how much sun is required and when to seek it confused many of the outdoor workers. This confusion placed a significant barrier on the sun safety behaviours of outdoor workers, who did not recognise that this message would not apply to them due to their comparatively high levels of UV exposure.

Some confusion regarding the hierarchy of control and the need to adopt sustainable sun safe practices was evident in certain workplaces. One of the key principles of health promotion is to make the healthy choice the easy choice; however, in a number of workplaces employers’ perceptions of the “easy choice” was to provide PPE and, as previously discussed, this is not considered the healthiest or safest option.

Workers were battling with many competing requirements (besides working efficiently), and were often overwhelmed when asked to recall all the various health and safety efforts they should be undertaking. Integrative messages which suit several health and safety issues were preferred and reduced the possibility of counterproductive or mixed messages. Successful messages were described by the workers as those which were “making sense” to them. These messages had immediacy and were used in the correct temporal context for the workers, making them relevant to their current situation and work environment (which changed regularly and frequently for outdoor workers).

Workplace culture

Although workplace culture was identified as an enabler, it was also a barrier in some workplaces. Smaller workplaces sometimes lacked capacity in the areas of health and safety skills, financial resources or specialised staffing that larger workplaces could rely on to ensure sun safety measures were implemented. Smaller workplaces were also vulnerable to changes in workload, with clear ebbs and flows in their engagement as workloads changed during the implementation phase. Larger organisations can inadvertently undermine sun safe policy intention with other policies; for example, in one large organisation the process of creating and requiring a corporate uniform involving a peak cap was in tension with best sun safety PPE Practice. Additionally, work sites which were part of a large state-wide or national organisation faced the challenge of gaining formal support for particular types of strategy from different levels of management. Support from senior management and local leadership could be undermined by limited engagement or support from regional-level management. Larger organisations need to ensure that all levels of management play a supportive role. Larger workplaces often required several steps of approval and took longer to be engaged in the policy adoption process, yet once engaged, the reach of sun safety improvements within the large organisations was much greater.

Discussion

Many of the key enablers identified in this study are supported by the literature. For example, there is a significant body of research which indicates the importance of a champion in facilitating workplace innovations through phases of initiation, development and implementation. The literature also suggests the presence of a workplace champion is important in male-dominated workplaces in particular, such as outdoor workplaces.
As with this study, other cross-sectional studies suggest the importance of workplace culture in promoting sun safe behaviours. Two New Zealand studies\textsuperscript{16, 17} found workers who perceived sun protection to be valued at their workplace engaged to a greater degree in sun safe behaviours. Also, an American study reported a positive association between social norms and lifeguards’ sun protection.\textsuperscript{18} However, there remains no specific prospective evidence for directly intervening on workplace culture to improve sun safety.\textsuperscript{19}

Educational material underpins the sun safety approach in Australia, and were a key aspect of this project. Research\textsuperscript{20} has identified workplace interventions incorporating the distribution of educational material and professional instruction were more successful than interventions that did not. A systematic review of interventions to reduce skin cancer\textsuperscript{21} also identified workers exposed to photograph and/or video information about skin cancer increased sun protection behaviour significantly, and this was maintained at 12 months.

Many of the key barriers identified in this study are supported by the literature. A systematic review of workplace health promotion programs concluded the two major challenges to the success of programs were achieving high participation rates and maintaining behaviour change over time.\textsuperscript{21} As with many studies investigating outdoor workers,\textsuperscript{17, 24} this study found the Australian outdoor worker culture hindered sun safe behaviours.

Evidence indicates behaviour change in the workplace can occur with education and social support from colleagues.\textsuperscript{22} Outdoor worker culture has been identified as a barrier to wearing sun safety clothing; for example, an Australian study\textsuperscript{23} found just 10\% of outdoor workers were using adequate sun protective equipment, and a British study\textsuperscript{2} found only 23\% of construction workers wore wide-brimmed hats and 51\% wore long-sleeved shirts at work. Additionally, overt reciprocity between the workers and workplaces has been found in other similar studies\textsuperscript{25} and further exploration of this phenomenon is justified.

\textbf{Conclusion}

In line with the Ottawa Charter, the development and adoption of a workplace sun safety policy was fundamental to providing the foundation for organisational and behavioural sun safety changes in each workplace. This outdoor sun safe intervention reinforces the need for a comprehensive approach to protecting workers from any hazard and provides evidence that participation and engagement with those most affected by the hazard is worthwhile in generating tailor made solutions.

Across the 14 workplaces, a number of enabling factors were identified — including having a designated workplace champion for sun safety, encouraging participation and innovation, having relevant and contextual resources, and celebrating small wins on a lengthy journey. Many barriers were experienced — including the absence of any specific legislative mandate for sun safety in Queensland workplaces, the need to overcome the misconception that the “tanned Aussie” is healthy, and the delivery of clear, concise and non-conflicting messages.

The participatory nature of this project necessitated the research team to relinquish power of the process and transfer this to the individual workplaces. In essence, the research team’s role was to facilitate action rather than direct it. Although challenging at times, this proved to be a key factor in the success of the project. It provides evidence that context-responsive customisation and tailoring of strategies to address identified workplace needs offers a greater chance of success when compared with more generic programs, strategies and resources.

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\textbf{Footnotes}
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