A safe place in the sun

Evaluating a sun safety intervention for the UK construction sector

Summary report 2015

IOSH, the Chartered body for safety and health professionals, is committed to evidence-based practice in workplace safety and health. We maintain a Research for Public Benefit Fund to support research and inspire innovation as part of our work as a thought leader in safety and health.

All recipients of funding from our Research for Public Benefit Fund are asked to compile a comprehensive research report of their findings, which is subject to peer review.

For more information, visit our research page.

In this document, you'll find a summary of the independent study we commissioned from the University of Nottingham, 'Sun safety in construction: evaluation of a sun safety intervention for the UK construction sector'. The researchers would like to thank all those organisations and individuals that took part in the research, as well as those who facilitated their contact with organisations and individuals.

What's the problem?

Outdoor workers are at an increased risk of skin cancer caused by exposure to the sun (solar ultraviolet radiation). Cancer mortality and incidence data for Great Britain suggest that construction workers account for around 58 per cent of occupational cancer deaths and 55 per cent of occupational cancer registrations attributed to sun exposure. Skin cancer accounts for 7 per cent of diagnosed work-related disease among construction workers in the UK (1996–2000), and national surveillance data (2002–2008) indicate that exposure to solar ultraviolet radiation was the suspected cause in all but one reported case of skin cancer among skilled tradespeople.

The high incidence of skin cancer among construction workers in the UK and the preventability of the disease highlight a need for action to improve sun safety in the sector. Until recently there were no construction sectorspecific training packages for this topic and there was a lack of scientific evidence on the effectiveness of sun safety training in UK construction. In response to this problem, IOSH awarded a Development Fund grant to Dr Jonathan Houdmont and Paul Madgwick of the University of Nottingham. The grant was awarded to develop the *Sun Safety in Construction* awareness DVD.

Research aims

This report, funded through the IOSH Research Fund, describes a project concerned with evaluating the impact of the Sun Safety in Construction DVD. The aims of the project were to:

- establish sun safety knowledge, attitudes and behaviours among a large sample of workers from the UK construction sector
- administer and evaluate the *Sun Safety in Construction* DVD among a large sample of workers from the UK construction sector
- examine the views of workers and employers on barriers to sun safety in the UK construction sector, as well as factors that might stimulate awareness and concern.

What did our researchers do?

The first aim was to develop an understanding of sun safety among a large sample of workers from the UK construction sector. This part of the study had two purposes. First, by establishing existing levels of sun safety knowledge, attitudes and behaviours, the researchers gathered data to help clarify the focus of future sector-specific campaigns (interventions) and the occupational health policy agenda. Second, this activity provided a baseline 'sun safety' profile against which to compare study participants' knowledge, attitudes and behaviours 12 months after they had

viewed the *Sun Safety in Construction* DVD. This allowed conclusions to be drawn on the extent to which exposure to a training intervention might enhance sun safety. Questionnaires were sent to workers across the UK between May and August 2012. A total of 1,279 completed questionnaires were returned. Responses were drawn from across the UK and included different trades and company sizes, suggesting that the sample was broadly representative of the UK construction sector. After removing questionnaires that contained no information on hours spent working outdoors and those that indicated zero outdoor work, analyses were conducted on a final sample of 1,154 responses.

The second aim was to administer and evaluate the Sun Safety in Construction DVD among a large sample of workers from the UK construction sector. The 12-minute DVD addressed:

- the risk of skin cancer in the UK construction sector
- sun safety behaviours that might be adopted on construction sites
- the self-checking of skin for signs of skin cancer.

Workers across the UK construction sector were shown the DVD between May and August 2012. In order to evaluate the intervention, individuals who provided contact information on the pre-awareness (baseline) questionnaire (n = 906) were sent a follow-up (post-intervention) questionnaire in the summer of 2013. A total of 160 questionnaires were returned (an 18 per cent response rate).

The intervention group consisted of respondents who:

- returned a completed baseline questionnaire
- indicated on the follow-up questionnaire that they had viewed the *Sun Safety in Construction* DVD
- indicated that they worked outdoors.

The control group consisted of respondents who:

- returned a completed baseline questionnaire
- returned a completed follow-up questionnaire
- indicated on the follow-up questionnaire that they had not viewed the *Sun Safety in Construction* DVD
- indicated that they worked outdoors.

Forty of the individuals who responded to the follow-up questionnaire didn't provide the researchers with enough information, so were excluded from the study. As a result, analyses were conducted on a sample of 120 cases divided across the intervention group (n = 70) and the control group (n = 50).

The final aim of the project was to examine the views of workers and employers on the barriers and facilitators to sun safety awareness in the UK construction sector. Four focus groups, each consisting of six managers who had responsibility for workers' safety and health, were conducted between March and April 2013. In addition, four focus groups, each involving six workers, were held over the same period. Participants were asked to consider those factors that might encourage, and those that might discourage, sun safety in the sector.

What did our researchers find out?

Study aim 1

- Respondents to the baseline (pre-intervention) survey worked outdoors for an average (mean) of 6.7 hours on a typical working day.
- More than half of the respondents (55 per cent) were either 'very pale' or 'fair/pale', indicating that most were at a high risk of developing skin cancer.
- In the past 12 months, most respondents (59 per cent) had experienced sunburn that remained red for a day or more.
- Most respondents (82 per cent) had never had their skin checked by a health professional for signs of cancer. More than half (61 per cent) indicated that in the past 12 months they hadn't checked areas of their body that were regularly exposed to the sun for moles or skin damage.
- Seventy per cent had never had training on the risks of working in the sun.
- Relatively few respondents (34 per cent) thought they were at risk of skin cancer, and a similar proportion (39 per cent) indicated that they didn't know if they were at risk. Almost three quarters (70 per cent) indicated that they like to have a tan.
- Most respondents regularly used three (from a list of 10) sun safety measures:
    - wearing sunglasses (55 per cent)
    - applying sunscreen (57 per cent)
    - drinking lots of water (86 per cent).
- Most respondents failed to regularly use seven sun safety measures. Few used measures that minimise direct exposure to ultraviolet (UV) rays through modifications to work organisation. For example, 21 per cent regularly avoided or minimised their exposure to direct sunlight in the middle of the day; 13 per cent regularly swapped jobs to reduce exposure to direct sunlight; and 24 per cent regularly used a shade or cover when working outdoors in the sun. As for clothing, 42 per cent reported that they wore long-sleeved, loose-fitting tops and trousers when working outdoors in the summer, while 23 per cent wore a safety helmet with neck protection. Eighty-eight per cent didn't regularly check

the UV index forecast and 59 per cent didn't regularly check their skin for moles or unusual changes.

Study aim 2

- Participants' responses to the baseline and postintervention questionnaires were compared. The intervention group demonstrated positive change across a set of knowledge and attitude criteria. The strongest positive change was knowledge of the need to wear sunscreen on a cloudy day (34 per cent increase). The second strongest positive change was a post-intervention fall in the proportion of respondents who indicated a desire for a suntan (17 per cent decrease). The third strongest positive change was knowledge about the need to wear sunglasses to protect the eyes from the sun (13 per cent increase).
- Among intervention group participants, positive changes were found across a set of 10 sun safety behaviours: on five of the 10 behaviours, the proportion of participants who typically used the measure when working outdoors in the summer increased by more than 20 per cent. On most behaviours for which the intervention group displayed positive change, the control group showed no improvement or less improvement, suggesting that positive changes demonstrated by the intervention group can be attributed with a high degree of confidence to exposure to the DVD.
- Particularly strong results emerged in relation to:
    - Using a shade or cover when working in the sun (see Figure 1). At baseline, one quarter (26 per cent) of the intervention group participants typically used this measure when working outdoors in the summer; post-intervention, more than half (59 per cent) of the group did so. In contrast, the control group showed no change between baseline and follow-up.
    - Using a safety helmet with neck protection (see Figure 2). At baseline, one fifth (21 per cent) of the intervention group participants typically used this measure when working outdoors in the summer; post-intervention, almost one third (30 per cent) of the group did so. The control group showed no change.

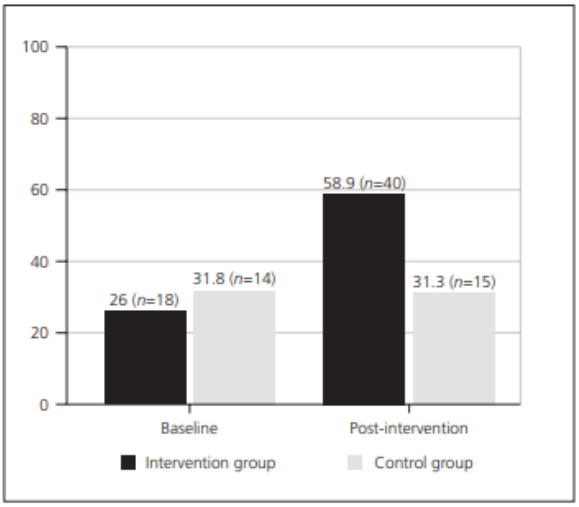

Figure 1
Respondents using a shade or cover when working in the sun

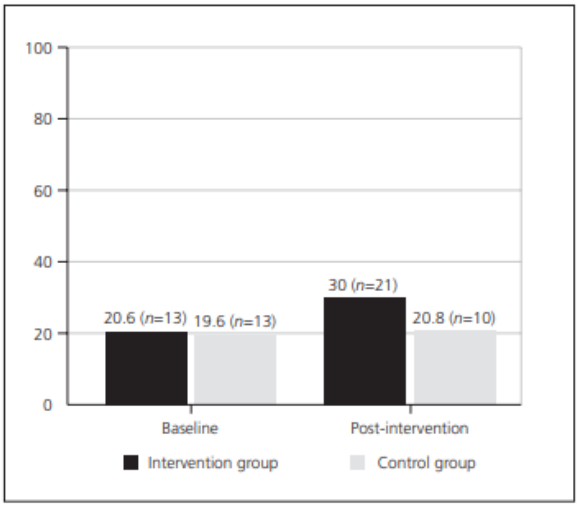

Figure 2
Respondents using a safety helmet with neck protection when working in the sun

- Wearing sunglasses (see Figure 3). At baseline, half (50 per cent) of the intervention group participants typically used the measure when working outdoors in the summer; post-intervention, almost three quarters (72 per cent) of the group did so. The control group showed no change.

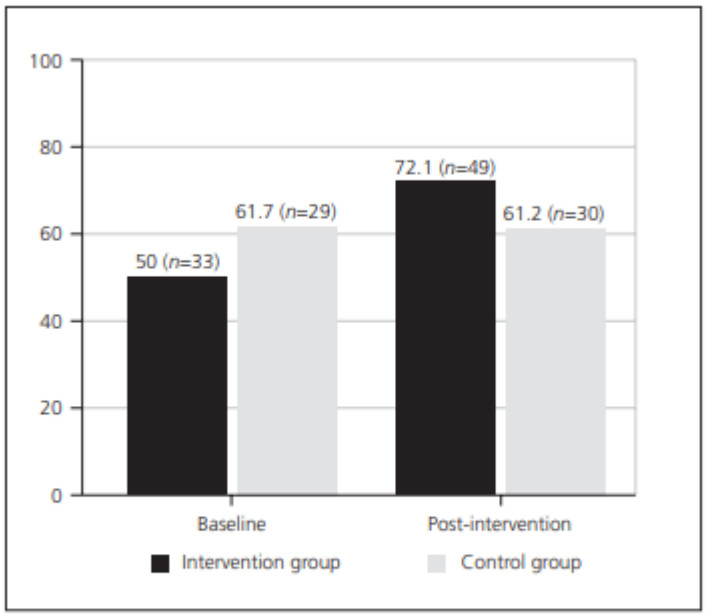

Figure 3
Respondents wearing sunglasses when working in the sun

Study aim 3

- The focus groups identified a range of attitudes and beliefs that were facilitators and barriers to sun safety in the sector. Those viewed as potential barriers to the development of a sun safety culture included:
    - ambiguity over whether responsibility lies with the employer or employee
    - the financial cost of introducing protective measures
    - the perceived non-relevance of sun safety given the UK climate.
- Social influences on sun safety included pressure from colleagues and the fashion for a tan.
- Legislation, education of the workforce, and the widespread availability of sun safe clothing were viewed as key factors that might influence the development of a sun safety culture in the UK construction sector.

What does the research mean?

The *Sun Safety in Construction* DVD is effective in producing significant positive change in UK construction workers' sun safety knowledge, attitudes and behaviours. The research suggests that employers should seek to adopt a sun safety culture in the following ways:

- show the *Sun Safety in Construction* DVD each spring to workers whose job requires them to spend time outdoors
- organise work schedules to minimise sun exposure in the middle of the day – where it's not possible to avoid outdoor work in the middle of the day, employers should provide a sun shade or some form of protective cover
- supply protective clothing to workers, particularly hard hats fitted with protective neck flaps
- supply workers with sunscreen and water
- enforce the use of clothing-based sun safety measures, such as neck flaps, long-sleeved tops, and trousers made of a suitable material, to provide protection without increasing the risk of the worker over-heating.

The research findings indicate that construction workers should:

- take responsibility for their health by using a range of sun safety measures according to the weather conditions and type of work they do
- encourage employers to provide sun safety measures (such as neck covers), arrange work schedules to minimise work in the sun in the middle of the day, and provide sun shades or covers when outdoor work in the middle of the day is unavoidable.

The research findings also indicate that the UK construction industry and its representative bodies should:

- seek to ensure that the Sun Safety in Construction DVD is made freely available online and that employers are made aware of its existence through appropriate promotion
- support research into the efficacy and development of smartphone apps – personalisable on the basis of skin type – that can provide manual outdoor workers with daily information on the solar ultraviolet risk and guidance on the sun safety measures that might be taken
- work towards sun safety provisions (such as hard hats with protective neck flaps) being built into tender specifications – a financial level playing field is likely to be required to stimulate employers into providing sun safety measures
- make available – on a retail and wholesale basis – sun safety protective clothing that's targeted at construction workers. Post-intervention, 30 per cent of participants in the current study reported using a neck flap (relative to 21 per cent pre-intervention). Challenges in sourcing such a sun safety measure are likely to help explain this relatively small increase.

Further research

Further studies should be carried out that develop and evaluate similar interventions for other high-risk outdoor worker groups. Interventions of the type examined in the current study can be developed at relatively little expense, and the key messages of sun safety tailored to specific occupational groups with ease.

Don't forget

The study relied on self-report measures of sun safety behaviours which can lead to 'common method variance' and biased responses. However, participants were able to complete questionnaires at a time and place that suited them, and send them back directly to the research team.

The retention rate for the follow-up questionnaire was 18 per cent. This was sufficient to facilitate whole-group comparisons pre- and post-intervention, but prevented more detailed analysis of pre-post intervention change by socio-demographic and occupational characteristics. For example, it would have been interesting to examine whether respondents with high-risk skin types reported greater post-intervention behaviour change than those with lower-risk skin types.

Weather conditions might have had an influence on the reporting of sun safety behaviours. The pre-intervention data collection took place in the summer of 2012, the wettest since records began in 1910. Post-intervention data were collected in the

summer of 2013, the sunniest since 2006. The control group would have experienced the same weather conditions and showed either no changes or changes of a lesser magnitude on most of the 10 sun safety measures.

It's possible that the sun safety behaviours of control group participants were influenced by the behaviours of those in the intervention group. For example, if a worker who viewed the DVD subsequently used sunscreen when working outdoors, and that individual worked alongside someone who had not viewed the DVD (but who had completed both the baseline and follow-up questionnaires), it's possible that the sun safety behaviours of the latter individual might have been influenced by the former.

Our current position

Cancer caused by work claims the lives of 666,000 people a year worldwide. IOSH's current campaign, No Time to Lose, aims to get carcinogenic exposure issues more widely understood and help businesses take action. Go to notimetolose.org.uk to download free resources to help raise awareness and prevent carcinogenic exposures at work. Our resource library currently includes packs on diesel exhaust emissions and ultraviolet radiation.

You can also view research documents at iosh.com/research:

- The burden of occupational cancer
- Sun safety in construction

Our summary gives you the major findings of the independent project report by the University of Nottingham. If you want to read about the study in more depth, you can download the full report at **iosh.com/research**.

IOSH is the Chartered body for health and safety professionals. With over 50,000 members in more than 130 countries, we're the world's largest professional health and safety organisation.

We set standards and support, develop and connect our members with resources, guidance, events and training. We're the voice of the profession and campaign on issues that affect millions of working people.

IOSH was founded in 1945 and is a registered charity with international NGO status.

IOSH
The Grange
Highfield Drive
Wigston
Leicestershire
LE18 1NN
UK
+44 (0)116 350 0700
www.iosh.com

twitter.com/IOSH_tweets

facebook.com/IOSHofficial

linkedin.com/company/iosh

youtube.com/IOSHchannel

instagram.com/ioshofficial

tiktok.com/@ioshofficial

Reg Office: IOSH, The Grange, Highfield Drive, Wigston, Leicestershire, LE18 1NN, United Kingdom © 2023 IOSH. Registered charity in England and Wales No. 1096790 and Scotland No. SC043254. VAT registration number 705 3242 69. IOSH Services Limited company registration number 01816826

POL3667/090816