A systematic review of the effectiveness of occupational health and safety training

CRD summary
The review concluded that occupational health and safety training positively affected worker behaviours, but there was insufficient evidence of the effect on health, attitudes and beliefs, and knowledge. The review was generally well conducted, and the authors’ conclusions appropriately acknowledge the limitations in the evidence base and seem reliable.

Authors’ objectives
To determine the effectiveness of occupational health and safety training, and to determine whether higher engagement training was more effective than lower engagement training.

Searching
Ten databases including MEDLINE, EMBASE and PsycINFO searched from 1996 to November 2007 for articles in English or French. Search terms were reported. Reference lists were checked and experts contacted.

Study selection
Randomised controlled trials (RCTs) of occupational health and safety training aimed at the primary prevention of workplace injury and/or illness were eligible for inclusion. Trials had to report a pre and post measure for both groups as well as a worker, organisation, or societal outcome related to occupational health and safety training. The following interventions were excluded: secondary prevention, social marketing, physical fitness, health promotion and multi-component interventions where the training component could not be isolated.

Trials included a range of populations, types of training and occupational hazards. Most trials included experienced workers, but some studied trainee workers. Interventions were typically multi-component and involved a variety of training methods, such as lectures, printed materials, hands-on practice and feedback.

One reviewer undertook the first stage of screening, and two reviewers independently performed the subsequent stages of study selection. Disagreements were resolved by consensus or a third reviewer.

Assessment of study quality
Quality was assessed using a 16-item instrument which appraised randomisation, allocation concealment, baseline group similarity and blinding. Trials that scored 0 to 1 were deemed good quality, trials that scored 2 to 4 were deemed fair quality, and trials that scored 5 or more were judged limited quality.

Two reviewers independently assessed quality.

Data extraction
Data were extracted on the effectiveness of interventions and used to calculate effect sizes.

Two reviewers independently extracted data; disagreements were resolved by consensus.

Methods of synthesis
A narrative synthesis was presented. Trials were grouped by type of outcome and level of engagement. Effect sizes were calculated for each outcome. The evidence was graded as strong, sufficient or insufficient based on the effect size, quality assessment, number of studies and consistency of effects. Post-hoc sensitivity analysis was undertaken which included poor quality studies. Other post-hoc analyses were undertaken.

Results of the review
Twenty trials were included in the review (approximately 10,213 participants). The study sample size ranged from 15 to 2,219 (median 209). Eight trials were limited quality and twelve trials were fair/good quality.
Ten studies showed generally positive effects on worker behaviours following occupational health and safety training, and the evidence was deemed strong. Five trials showed a positive effect of occupational health and safety training on knowledge, but three studies were deemed poor quality so the evidence for this outcome was deemed insufficient. Ten studies that reported on health showed mixed/limited effects, so this evidence was insufficient. Three studies showed mixed/limited effects of training on attitudes and beliefs, which was also insufficient evidence. There was limited evidence on the effectiveness of higher versus lower engagement.

**Authors' conclusions**
Occupational health and safety training positively affected worker behaviours, but there was insufficient evidence of the effect on health, attitudes and beliefs, and knowledge.

**CRD commentary**
Inclusion criteria for the review were appropriately defined and several relevant databases were searched. There may have been the potential for language bias, as only studies in English and French were included. Publication bias was not assessed so could not be ruled out. Attempts were made to minimise reviewer error and bias throughout the review. Quality assessment was undertaken and quality issues were considered when interpreting the results. A narrative synthesis was presented, which seemed appropriate given the type of evidence.

Overall, the review was generally well conducted and the authors’ conclusions appropriately acknowledge the limitations in the evidence base and seem reliable.

**Implications of the review for practice and research**

**Practice:** The authors stated that workplaces should continue to deliver occupational health and safety training to their workers. However, decision-makers should consider more than just education and training when addressing risk in the workplace as, based on available evidence, training alone could not be expected to have a large impact.

**Research:** The authors stated that primary research should continue to explore the issue of worker engagement level. Future studies should also aim to report their methods more fully. Health researchers should aim to collect information on knowledge and attitude outcomes. Future reviews should also include non-randomised studies due to the scarcity of evidence.

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