"A hard day's night?" The effects of Compressed Working Week interventions on the health and work-life balance of shift workers: a systematic review

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CRD summary
The review found evidence to suggest the Compressed Working Week can improve work-life balance and may do so with a low risk of adverse health or organisational effects. The authors' conclusion is an accurate reflection of the evidence presented, but it should be borne in mind that it is based on studies of poor methodological quality.

Authors' objectives
To evaluate the effects of the Compressed Working Week (CWW) on the health and work-life balance of shift workers, and to identify any differential impacts by socio-economic group.

Searching
ASSIA, EU Community Research and Development Information Service, Dissertation Abstracts, Eric, European Commission Libraries Catalogue, EconLit, Electronic Collections Online, EMBASE, GEOBASE, Harvard Business Review, HMIC, Index to Theses, International Bibliography of Social Sciences, JSTOR, Labordoc (International Labour Organization database), Management Contents, MEDLINE, NTIS, PAIS International, PapersFirst, PsycINFO, REGARD, SIGLE, Sociological abstracts databases and websites were searched to November 2005. No language restrictions were applied. Search terms were reported. Bibliographies and reference lists were searched for additional articles.

Study selection
Any study evaluating the effects of Compressed Working Week interventions on health and work-life-balance of shift workers and their families were eligible for inclusion. Shift work was defined as any regularly taken employment outside the hours of 07:00 to 18:00. Included studies had to evaluate interventions implemented in workplaces. Compressed Working Week was defined as an alternative work schedule where the hours worked per day were increased and the days worked were decreased to enable the standard number of weekly hours to be fitted into less than five days. Health outcomes of interest included specific diseases, physical and psychological health and wellbeing, sickness absence, health behaviours and injuries that resulted from accidents in the workplace, physiological, physical and mental wellbeing measures and social impacts, and impacts on health inequalities. Other outcomes of interest were organisational effects, such as job satisfaction, individual or organisational performance if reported together with health and work-life-balance outcomes.

Compressed working week interventions in the included studies varied in terms of number of hours worked per shift and number of days in a shift, as well as number of days off (details were reported). Settings of interventions included police force, mine operation, chemical plant, hospital, confectionery factory, gas processing plant, computer company, fire service, manufacturing, sewage treatment plant, nuclear power plant, electrical power station and prison. Participants included police officers, fire fighters, nurses, ambulance workers and paramedics, sewage plant workers, power plant workers, prison officers, production workers and operators in coal and mineral mines, computer and processing plants. Most studies had self-reported measures of outcomes.

Two reviewers independently selected studies for inclusion from full paper copies. Disagreements were resolved through discussion and reference to original papers.

Assessment of study quality
Validity was assessed using established criteria that assessed: representativeness of sample; presence of an appropriate control group; baseline response rate; follow-up rate; reporting of withdrawals and dropouts; adjustment for confounders; exposure to intervention and contamination between groups; appropriate use of statistical tests; and substantiated conclusions. Validity criteria were for descriptive purposes only and to highlight variations in study quality. No quality score was calculated. Validity was assessed independently by two reviewers.
Data extraction
Data were extracted on percentages, confidence intervals (CI), p values and effects sizes for the outcomes of interest. Where data were missing, statistics were calculated using final sample size where there was sufficient data.

Data were extracted by one reviewer and checked by a second.

Methods of synthesis
Studies were grouped by outcome and combined using a narrative synthesis. Additional data was presented in tables.

Results of the review
Forty observational studies (n>3,014; sample size not reported for one study) were included in the review: five prospective cohort studies with control groups; 18 prospective cohort studies; three prospective repeat cross-sectional studies with control group; two prospective repeat cross-sectional studies; two retrospective cohort studies with control group; nine retrospective cohort studies; and one retrospective repeat cross-sectional study.

The quality of the included studies was not rated very high. Most studies measured self-reported outcomes. Sample sizes ranged from three to 300. Follow-up ranged between one and 12 months for most studies (maximum eight years).

Health-related outcomes (40 studies): Twenty seven studies (which included four prospective controlled studies) reported improvements in workforce health as a result of Compressed Working Week interventions. Eleven studies (including one prospective controlled study) reported no change. Two studies reported negative effects.

Fatigue (18 studies): Three studies reported improvements in levels of fatigue after the introduction of Compressed Working Week. Four studies reported an adverse change in fatigue levels. Eleven studies reported no change in fatigue.

Work-life balance (23 studies): Sixteen studies (which included three prospective controlled studies) reported improvements in work-life balance after the introduction of Compressed Working Week. Four studies (two prospective controlled studies) reported no effects. Three studies reported worsening of work-life balance after the introduction of Compressed Working Week.

Health and work-life balance (17 studies): Twelve studies (which included three prospective controlled studies) that reported improvements in work-life balance also reported improvements in health (particularly mental health). Five studies reported health improvements despite there being no changes in work-life balance.

Organisational outcomes (25 studies): Eleven studies (which included three prospective controlled studies) reported no difference in organisation effects for Compressed Working Week. Benefits were reported for increased morale (three studies), increased job satisfaction (three studies), better productivity and quality (two studies), better organisational effect (one study) and reduced staff costs and error (two studies). Adverse effects were reported for increased turnover in staff (one study), decreased job satisfaction (one study) and decreased performance (two studies).

Authors’ conclusions
The findings suggested that the Compressed Working Week can improve work-life balance and may do so with a low risk of adverse health or organisational effects.

CRD commentary
This review addressed a clear question with defined inclusion criteria. Several relevant sources were searched, efforts were made to identify unpublished studies and no language restrictions were applied, which reduced the likelihood of publication and language biases. Appropriate methods were used to minimise reviewer error and bias for study selection, validity assessment and data extraction. Validity was assessed using established criteria and the results of the assessment were reported and used to inform the synthesis. A narrative synthesis was appropriate given the between-study differences of design, intervention, outcomes and participants. The authors appropriately stated a number of limitations of the evidence, which included: a number of studies included homogenous populations (police officer, nurses, fire fighters), so the results of the review may not be generalisable to other occupations; all included studies were from the public domain and may not be generalisable to commercial settings; small sample sizes for a number of
studies; and outcomes were self-reported measures. The authors' conclusion is an accurate reflection of the evidence presented, but it should be borne in mind that it is based on studies of poor methodological quality.

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

**Practice:** The authors stated that the compressed working week could be an important tool for policymakers and employers in terms of promoting healthier workplaces and improving work practices.

**Research:** The authors stated that further prospective well-controlled methodologically robust research was required to measure objective health outcomes of a compressed working week intervention, in particular evaluation of mental health effects and any interaction with changes in work-life balance. Further research should investigate the impact of a compressed working week intervention on health inequalities among the working-age population as well as evaluating effects on health behaviours of shift workers.

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