Cost-effectiveness of interventions to return employees to work following long-term sickness absence due to musculoskeletal disorders

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
This study assessed the cost-effectiveness of three interventions to help employees with musculoskeletal disorders to return to work. The authors concluded that interventions that provided small increases in return to work were likely to be cost-effective, compared with usual care. The reporting was generally good, but the description of how the parameters were selected was limited. The authors’ conclusions, with their limitation that there was significant uncertainty in the model, were appropriate.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
This study assessed the cost-effectiveness of interventions to help employees, with musculoskeletal disorders, to return to work.

Interventions
Four options were compared: a workplace intervention; a physical activity and education intervention; a physical activity, education and workplace visit intervention; and usual care. The workplace intervention involved an assessment of the workplace, with work modifications, based on participative ergonomics. The physical activity and education intervention was any physical activity that taught patients how to deal with their pain and body mechanics. The workplace visit was made by a physical therapist to facilitate employer and employee involvement in rehabilitation. Usual care was visits to the general practitioner and analgesics.

Location/setting
UK/out-patient.

Methods
Analytical approach:
A Markov model was developed of a cohort of employees, who had been on sick leave for between one week and six months. There were six states in the model: at work, on sick leave for one week to six months, on sick leave for six to 12 months, on sick leave for 12 to 18 months, on sick leave for over 18 months, and permanently unemployed due to retirement or death. Patients in any of the sick leave states could return to work, and they could transition to permanent unemployment from any other state. Of the sick leave states, patients could only stay in the over 18 months state. The model had a lifetime horizon, with six-month cycles and half-cycle correction. The authors stated that a NHS and Personal and Social Service (PSS) perspective, a societal perspective, and an employer perspective were taken.

Effectiveness data:
The primary effectiveness measure was the increased likelihood (relative risk) of return to work, within the first six months of sick leave. This was identified by a systematic review conducted for a National Institute for Health and Clinical Excellence (NICE) Public Health Guideline 19 (see Other Publications of Related Interest). The workplace intervention relative risk was from one randomised controlled trial, while the relative risks for the other interventions were from meta-analyses. If an employee had not responded to an intervention at six months, it was assumed that they were no more likely to return to work than if they were receiving usual care.
Monetary benefit and utility valuations:
The utilities were from a published study of data from the British Household Panel Survey. This survey collected data on people who had been both at work and on sick leave, in the previous 10 years. The study gathered SF-36 data, which was transformed into SF-6D utility scores using a published algorithm. The underlying illness (musculoskeletal disorder) was not directly modelled within the utility estimates, which were based on age and sick-leave status.

Measure of benefit:
Quality-adjusted life-years were the summary measure of benefit, for the NHS and PSS perspective, and the societal perspective. The avoided days on sick leave was the measure of benefit, for the employer perspective.

Cost data:
The costs, for the NHS and PSS perspective, were from the Personal Social Services Research Unit, and the British National Formulary, with resources from a published study or the opinion of named experts. The costs were primary care, medication, physiotherapy, osteopathy, chiropractice, and the intervention. Intervention costs were from published studies and government data. The costs, for the employer perspective, were those paid by the employer for the intervention, a replacement worker, production lost over a friction period, occupational sick pay, and National Insurance contributions. The friction period was from an international human resources firm. Sick pay and National Insurance costs were from the Department for Work and Pensions. The costs, for the societal perspective included NHS and PSS, and employer costs, excluding the salary of a replacement worker, sick pay, and National Insurance contributions. All costs were for the one week to six months period. After six months, the costs for the NHS and PSS perspective and societal perspective were those of usual care; for the employer they were sick pay and National Insurance from six to 12 months, and nothing after 12 months. All costs were in UK £.

Analysis of uncertainty:
Numerous one-way sensitivity analyses were conducted; all the parameters varied and the results were available in an appendix, and the influential results were reported. The relative risk of return to work with an intervention was varied from 1.05 to 1.4, while varying the additional cost of the intervention, compared with usual care, from zero to £5,000.

Results
Compared with usual care, from both the NHS and PSS, and societal perspectives, the physical activity and education intervention had an incremental cost-effectiveness ratio (ICER) of approximately £2,800 per QALY gained. The other interventions were dominant over usual care, as they were less costly and more effective. The physical activity, education and workplace visit intervention was the least costly and most effective.

Compared with usual care, from the employer perspective, interventions that did not require a large cost input by the employer were likely to be cost saving. The most cost-saving interventions were physical activity and education; and physical activity, education and a workplace visit.

One-way sensitivity analysis showed that lowering the differences in quality of life between people working and people on sick leave to 0.02, increased the ICER for physical activity and education to £23,000 per QALY gained, while the other interventions remained less costly and more effective than usual care. The ICERs were likely to remain under £20,000 per QALY gained, as long as the intervention cost less than £3,000 and at least an additional 3% of people returned to work, without accounting for uncertainty in any of the other model parameters.

Authors' conclusions
The authors concluded that interventions that provided small increases in return to work were likely to be cost-effective, compared with the usual interventions.

CRD commentary
Interventions:
The interventions were well reported, with references for further detail. It was not clear if all the relevant categories of intervention were included, but there was a broad spectrum that represented the interventions found in a systematic review.

Effectiveness/benefits:
The methods used to meta-analyse the effectiveness data were not reported, but references were given. The authors stated that there was heterogeneity in the study characteristics, but this was not described. The model assumed that the differences in QALYs, between the interventions and usual care, were only due to the probability of returning to work and not due to improvements in quality of life delivered by the interventions; the authors acknowledged that this was a limitation. The methods used to identify the study that provided the utility data were neither reported nor justified.

**Costs:**
The costs were well reported, and published UK government sources were used, where available, with published studies used, where government sources were not available. The experts were directly cited, but which data were from these experts was not reported. The methods for selecting the studies that provided the intervention costs were not reported. The model structure does not appear to allow different costs for patients who became permanently disabled at different ages. The price year was not reported, hindering reflation exercises.

**Analysis and results:**
The age of patients at the start of the model was not stated, so it was unclear how long the model was to represent their lifetime. Permanently unemployed and death appeared to be the same model state, but these should have different benefits and costs. The results were not presented incrementally, which the authors stated was due to uncertainty in the cost and effectiveness estimates. They did not explain why comparisons with usual care should be any more appropriate than comparisons with the other interventions. The results of the different interventions can be implicitly compared, and one intervention would have dominated the others, as it was more effective and less costly. No probabilistic sensitivity analysis was conducted, but a good justification was provided; the quality of the sources, and the simplifying assumptions due to a lack of data, created too much structural uncertainty for such an analysis. The authors acknowledged that this made further study necessary before firm conclusions could be drawn.

**Concluding remarks:**
The reporting of what was included in the model was generally good, but more thorough description of parameter selection and generation would improve the ability to judge the study's validity. The authors’ conclusions and limitations were appropriately cautious, given the stated uncertainty in the analysis.

**Funding**
Supported by the National Institute for Health and Clinical Excellence (NICE), UK.

**Bibliographic details**

**PubMedID**
21846930

**DOI**
10.1093/pubmed/fdr057

**Original Paper URL**
http://jpubhealth.oxfordjournals.org/content/34/1/115.abstract

**Other publications of related interest**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Adult; Cost-Benefit Analysis; Cross-Cultural Comparison; Great Britain; Humans; Markov Chains; Middle Aged; Motor Activity; Musculoskeletal Diseases /economics /therapy; Occupational Health Services /economics /methods; Outcome and Process Assessment (Health Care); Patient Education as Topic /economics /methods; Quality-Adjusted Life Years; Sick Leave /economics /statistics & numerical data; State Medicine /economics; Time Factors

**AccessionNumber**
22012024593

**Date bibliographic record published**
10/01/2013

**Date abstract record published**
14/05/2013