Cost-effectiveness of interventions to improve moderate physical activity: a study in nine UK sites

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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 effectiveness and cost-effectiveness of community-based interventions to increase moderate physical activity in adults and children, aged 10 to 17 years, who were not meeting the UK guidelines for moderate physical activity. The authors concluded that all the interventions were cost-effective and a good investment for the UK National Health Service. The methods and results were not clearly reported and it is difficult to assess if the authors’ conclusions are valid.

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

Study objective
The aim was to assess the effectiveness and cost-effectiveness of community-based interventions to increase moderate physical activity. The population included children, aged 10 to 17 years, and adults, particularly those aged 65 years or older, who did or did not have pre-existing health problems and were not meeting the UK guideline levels of moderate physical activity.

Interventions
A wide range of physical activity interventions were assessed. They were grouped into campaigns, exercise classes, exercise referrals (for patients with health problems), motivational interviews, outdoor activity, peer-monitoring, and leader training interventions. They were conducted in locations of high health need, in nine UK primary health care trusts. Testing occurred before and after the intervention, over varied durations, to estimate the changes in activity.

Location/setting
UK/community care.

Methods
Analytical approach:
The economic evaluation was undertaken alongside a single clinical and cost study. It used a published economic model (Matrix Research and Consulting. 2006, and Department of Health. 2007, see ‘Other Publications of Related Interest’ below for bibliographic details). The authors reported that the perspective was that of the UK National Health Service (NHS).

Effectiveness data:
The outcomes of interest were changes in moderate physical activity measured using the median metabolic equivalent minutes per week. The effectiveness estimates were collected via participant reports, using the short-form International Physical Activity Questionnaire, which was modified for children. The metabolic equivalent minutes of activity per week were measured before and after the interventions and averages were used. These estimates were also used to categorise participants into activity levels of sedentary, or lightly, moderately or highly active. Paired sample t-tests assessed the intervention effects.

Monetary benefit and utility valuations:
The utility values were from the developed economic model (Matrix Research and Consulting. 2006, and Department of Health. 2007).
Measure of benefit:
The measures of benefit were quality-adjusted life-years (QALYs) and the number of those participants who completed an intervention, who improved by at least one activity level.

Cost data:
During the clinical study, quarterly interviews were conducted to identify the personnel, training, premises, transport, equipment, publicity, and other running costs. The results of these interviews were used to estimate the average monthly implementation cost, the cost per participant, and the cost per participant who completed an intervention and improved by at least one activity level. These costs were adjusted to 2003 prices and were reported in UK pounds sterling (£).

Analysis of uncertainty:
The sensitivity analyses estimated the uncertainty around several assumptions that were required for the original model (Matrix Research and Consulting. 2006, and Department of Health. 2007).

Results
The change in moderate physical activity levels, from before to after the interventions, was a median improvement of 223 metabolic equivalent minutes per week or 75 minutes of brisk walking per week. Of those who completed an intervention, 37.9% improved by at least one activity level, while 59.9% of sedentary or lightly active participants who completed an intervention reached the guideline level of moderate physical activity. There was a wide variety of change in moderate physical activity levels across the intervention types and the outcomes were mixed, so that some interventions produced positive physical activity change, while others did not.

The mean monthly costs to the NHS ranged from £504 for exercise classes to £9,227 for exercise referrals. Campaigns ranged from £745 to £1,809, exercise classes from £504 to £6,387, exercise referrals from £648 to £9,227, motivational interviews from £1,216 to £4,429, outdoor activity from £1,211 to £1,729, peer-mentoring from £637 to £1,969, and training physical leaders from £1,030 to £1,302. The cost per participant attending the interventions ranged from £55 to £3,420. The cost per completer who improved by at least one activity level ranged from £260 to £2,786.

The cost per QALY gained from the interventions ranged from £47 (motivational interviews) to £509 (exercise referral), with this range being below the £20,000 per QALY threshold. The future cost savings for the NHS per intervention participant ranged from £769 (exercise classes) to £4,891 (exercise referral). There were wide variations between the interventions, but the savings per participant exceeded the cost per participant completing the invention, in all cases. The sensitivity analyses indicated that variations in the assumptions did not alter the cost-effectiveness findings.

Authors' conclusions
The authors concluded that all the interventions were cost-effective and a good investment for the UK NHS. No one intervention type was more cost-effective than the others, but certain interventions were more cost-effective for particular groups.

CRD commentary
Interventions:
The types of physical activity intervention were described briefly and a short description of each intervention was provided in the result tables. This should enable readers to identify the interventions that might be relevant in their own setting. The interventions appear to have been appropriate comparators, but it was unclear if the usual practice and all the relevant comparators were included.

Effectiveness/benefits:
The effectiveness data appear to have been from the single clinical and cost study, on which the model was based. It is unclear if a systematic review was undertaken to identify all the relevant information, which makes it difficult to ascertain whether the best available evidence was used. Little information about the source study was reported; the intervention durations, the individual change statistics, and the utility score methods were not given and randomisation was not reported. Therefore, it is unclear if the clinical evidence was of high quality. The utility valuation methods were provided elsewhere and this publication would need to be consulted to assess them. The authors stated that they
followed the National Institute for Health and Clinical Excellence (NICE) cost-effectiveness guidelines, which implies that the benefits were discounted at an annual rate of 3%, but this was not reported.

Costs:
The costing methods were reported briefly, including the types of costs and their assessment method. The authors stated that the perspective was that of the NHS, but patient out-of-pocket expenses and other indirect costs might be significant and could influence the intervention attendance levels. Cost adjustments were not reported, but would be relevant over a long period. As with the benefits, the use of NICE guidelines implies that the costs were discounted at an annual rate of 3%, but this was not stated.

Analysis and results:
The economic model was described in another publication. There was considerable description of the results for the intervention effectiveness, but only minimal information on the economic model and the sensitivity analyses. Therefore, a significant proportion of the methods and results were missing. The authors stated that the study sample mostly contained older women and this differed from the general intervention population, but they did not report adjusted multivariate costs nor behaviour change analyses. They also reported a drop-out rate of around 90%, but they didn't report any differences between the interventions. These two issues might have introduced bias. Their conclusion that no intervention was more cost-effective than another was not supported by their analyses, as average cost per QALY data were reported, rather than incremental ratios, which compare advantages between two or more interventions. The time horizon was not stated, but appears to have been the participants' lifetimes. This makes it uncertain whether all the relevant costs and benefits were included.

Concluding remarks:
As the economic analysis was not fully reported, it is difficult to assess if the authors' conclusions are reasonable.

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Other publications of related interest


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