Cost effectiveness of community-based physical activity interventions


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
The objective was to assess the cost-effectiveness of seven interventions to increase physical activity in an adult population aged 25 to 64 years. The authors concluded that all the interventions assessed were cost-effective and offered good value for money. While there were some limitations associated with the reporting of the study, in general the methods appear to have been robust and the authors’ conclusions seem to be appropriate.

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

Study objective
The objective was to assess the cost-effectiveness of seven interventions aimed at increasing physical activity, in an adult population aged 25 to 64 years, in the USA.

Interventions
The interventions were:

- the Stanford Five-City Project, a six-year community-wide health education intervention;
- Wheeling Walks, an eight-week community-wide intervention to promote walking;
- organised walking groups, social gatherings, etc, to promote physical activity;
- an initial training session for starting and maintaining a walking programme;
- personal trainers, therapy sessions, and financial incentives to increase physical activity;
- an intensive lifestyle modification programme for adults at high risk of developing type 2 diabetes;
- and exposure to an environment that emphasised and supported a more active lifestyle.

Location/setting
USA/the setting varied across interventions.

Methods
Analytical approach:
A Markov model was developed to estimate the clinical and cost outcomes associated with each of the interventions. A lifetime horizon was adopted and the authors stated that the perspective was societal.

Effectiveness data:
The effectiveness data were derived from published studies. Seven studies were chosen, each detailing one of the interventions. A number of inclusion criteria were used for the intervention studies, such as coverage of a period of three months or more and being a controlled study of adults. The main clinical parameters were disease incidence, disease risk by activity level, and mortality by activity level.

Monetary benefit and utility valuations:
The quality of life weights were derived from published studies and adjusted for age, gender, disease, and physical activity level.

Measure of benefit:
The primary measures of benefit were life-years gained and quality-adjusted life-years (QALYs) gained, which were
discounted at an annual rate of 3%.

Cost data:
For each intervention the costs of the materials and intervention delivery, out-of-pocket expenses paid by participants and the participants' time were included in the analysis. Where appropriate, the costs associated with developing and maintaining the infrastructure associated with the intervention were also included. These costs were obtained from the authors of the original studies. The medical costs, associated with specific diseases, were also included and were obtained from a medical claims database. The price year was 2003 and the costs were discounted at a rate of 3% per annum. All costs were reported in US dollars ($).

Analysis of uncertainty:
The uncertainty in the model parameters was investigated through one-way and probabilistic sensitivity analyses. The results of the probabilistic sensitivity analyses were reported in cost-effectiveness acceptability curves.

Results
Each intervention was compared with no intervention, over a 40-year time-horizon.

The Stanford Five-City Project was associated with a cost of $110,322 per life-year gained and $68,557 per QALY gained.
Wheeling Walks was associated with a cost of $22,654 per life-year gained and $14,286 per QALY gained.
The organised walking group was associated with a cost of $65,447 per life-year gained and $39,690 per QALY gained.
The initial training session was associated with a cost of $43,663 per life-year gained and $27,373 per QALY gained.
The personal trainer intervention was associated with a cost of $48,096 per life-year gained and $29,759 per QALY gained.
The intensive lifestyle modification programme for adults at high risk of type 2 diabetes was associated with a cost of $75,583 per life-year gained and $46,914 per QALY gained.
The environment that supported and encouraged a more active lifestyle was associated with a cost of $46,442 per life-year gained and $28,548 per QALY gained.

The one-way sensitivity analysis showed that these results were sensitive to the time horizon. The probabilistic sensitivity analyses showed, for example, that there was a 55% chance that the cost per QALY gained for the Stanford Five-City Project was less than $50,000.

Authors’ conclusions
The authors concluded that the seven interventions assessed were all cost-effective and offered good value for money.

CRD commentary
Interventions:
Each of the interventions was described and appears to have been relevant in the authors' setting. It would have been beneficial to have seen how these interventions compared with each other rather than compared with no intervention.

Effectiveness/benefits:
The seven studies (for the seven interventions) appear to have been selected and are unlikely to represent all such interventions. In general, the reporting of the effectiveness data was good, including the details of the effect size for each of the interventions. The outcome measure (QALYs) was suitable as it captures the impact of the interventions on the quality and length of life. The details of the methods used to determine the quality weights were reported and appear to have been appropriate.

Costs:
The costs appeared to reflect the perspective stated. The resource use associated with each of the interventions was obtained from the authors of the seven intervention studies, but it was unclear where the unit costs came from. The total costs per person associated with each intervention and disease state were reported, but the unit costs were not, which reduces the transparency of the cost analysis. Other details of the study, such as the price year, inflation rate and discounting were reported.
Analysis and results:
The authors compared each intervention against no intervention and the full results were presented. It was stated that an incremental analysis was undertaken, but the results of this were not presented. The results that were presented do not allow the identification of the most cost-effective strategy, they only describe the cost-effectiveness of each one relative to no intervention. The issue of uncertainty was investigated appropriately within the sensitivity analyses. Given that the unit costs were not reported and that the cost data were from a US societal perspective, it may be difficult to generalise these results to other settings. The authors discussed some limitations of their analysis.

Concluding remarks:
While there were some limitations associated with the reporting of the study, in general the methods appear to have been robust and the authors’ conclusions seem to be appropriate.

Funding
Supported by the Robert Wood Johnson Foundation, and the CDC Foundation.

Bibliographic details

PubMedID
19000846

DOI
10.1016/j.amepre.2008.06.040

Original Paper URL
http://download.journals.elsevierhealth.com/pdfs/journals/0749-3797/PIIS0749379708007708.pdf

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Centers for Disease Control and Prevention (U.S.); Chronic Disease /epidemiology /prevention & control; Cohort Studies; Cost-Benefit Analysis /economics; Exercise; Female; Health Care Costs; Health Promotion /economics; Humans; Life Style; Male; Markov Chains; Middle Aged; Physical Fitness /physiology; Quality of Life; Quality-Adjusted Life Years; Sensitivity and Specificity; United States /epidemiology

AccessionNumber
22009100041

Date bibliographic record published
02/03/2009

Date abstract record published
09/12/2009