

A Comparison of the Cost-effectiveness of Two Pedometer-based Telephone Coaching Programs for People with Cardiac Disease



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Introduction

Following a cardiac event it is recommended that cardiac patients participate in cardiac rehabilitation (CR) programs. However, little is known about the relative cost-effectiveness of lifestyle-related interventions for cardiac patients. This study aimed to compare the cost-effectiveness of a telephone-delivered Healthy Weight intervention to a telephone-delivered Physical Activity intervention for patients referred to CR in urban and rural Australia.

Methods

A cost-utility analysis was conducted alongside a randomised controlled trial of the two interventions. Outcomes were measured as Quality Adjusted Life Years (QALYs) gained.

Results

The estimated cost of delivering the interventions was \$201.48 per Healthy Weight participant and \$138.00 per Physical Activity participant. The average total cost (cost of health care utilisation plus patient costs) was \$1,260 per Healthy Weight participant and \$2,112 per Physical Activity participant, a difference of \$852 in favour of the Healthy Weight intervention. Healthy Weight participants gained an average of 0.007 additional QALYs than did Physical Activity participants. Thus, overall the Healthy Weight intervention dominated the Physical Activity intervention (Healthy Weight intervention was less costly and more effective than the Physical Activity intervention). Subgroup analyses showed the Healthy Weight intervention also dominated the Physical Activity intervention for rural participants and for participants who did not attend CR.

Conclusions

The low-contact pedometer-based telephone coaching Healthy Weight intervention is overall both less costly and more effective compared to the Physical Activity intervention, including for rural cardiac patients and patients that do not attend CR.

Keywords

Cost-effectiveness • Cardiac rehabilitation • Telephone coaching • Rural • Weight • Physical activity

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Introduction

Nearly \$6 billion (11%) of Australia's health care expenditure was spent on cardiovascular disease in 2005, making it the most expensive disease group in Australia [1]. Following a cardiac event, it is recommended that cardiac patients participate in exercise-based cardiac rehabilitation (CR) programs [2,3]. In Australia, a typical CR program is a seven week group program conducted in a hospital outpatient setting and includes education, counselling and supervised exercise components [2]. There is substantial evidence that CR attendees have reduced mortality [4,5], fewer subsequent non-fatal cardiac events and revascularisation procedures, and lower rehospitalisation rates compared to non-attendees [6]. However, less than one third of eligible patients attend a CR program [7,8] and rural residents are even less likely to attend [9]. For people who do attend CR a substantial treatment gap exists between the recommended targets for rehabilitation and actual patient outcomes [8].

To make the benefits of CR available to patients that are currently underserved, alternative models have been trialled and have been found to be efficacious [10,11]. Participants in the CHOICE study (one face-to-face session plus follow-up telephone calls) showed significant improvement in cardiac risk factors which were maintained at four-year follow-up [10]. A low-contact intervention (two telephone calls and behavioural self-monitoring) found significant improvements in physical activity levels [11].

Little is known about the relative cost-effectiveness of different CR interventions [12]. This study aimed to compare cost-effectiveness of a telephone-delivered Healthy Weight intervention to a telephone-delivered Physical Activity intervention for patients referred to CR in urban and rural Australia.

Methods

Conventionally, cost-effectiveness analyses compare a "new" intervention to usual care or current practice. However, as this economic evaluation was conducted alongside a randomised controlled trial designed to compare two new interventions, it represents a "within trial" evaluation, thus providing information about the interventions and their impact on population sub-groups. Details of the study design have been previously described [13].

Intervention Comparators

The trial was designed to compare two interventions, both based on social cognitive theory [14]. The Healthy Weight participants were mailed brochures, a calendar (to record nutrition and physical activity goals) and a pedometer. They took part in four telephone-coaching and goal setting sessions on weight, nutrition and physical activity via telephone over an eight week period, plus two booster calls after the intervention. If the participant's body mass index

(BMI=weight kg/height m²) was ≥ 25 kg/m² they were coached to follow the dietary guidelines [15], lose weight gradually and to undertake 60-90 minutes of physical activity on most days of the week [16]. If the participant's BMI was in the healthy range (18.5-24.9 kg/m²) they were advised to follow dietary guidelines [15], to maintain their current weight and to undertake at least 30 minutes of physical activity most days of the week [17]. The Physical Activity group received the same six week physical activity intervention previously found to be efficacious for people with cardiac disease [11]. The Physical Activity participants received a pedometer and step recording calendar via mail and participated in two telephone-coaching and goal setting sessions on physical activity, plus two booster phone calls. They were coached to undertake at least 30 minutes of physical activity most days of the week [17].

A total of 313 patients referred to, but not necessarily attending CR in rural and urban Australia participated in the study and were randomised to the Healthy Weight (n=156) or the Physical Activity only (n=157) intervention. There were no significant differences in demographic profile between the groups at baseline and no significant difference between the groups in terms of attrition from the interventions (88% of Healthy Weight and 92% Physical Activity participants completed the study). The outcomes of the randomised controlled trial have been published elsewhere [23]. In brief, participants in the Healthy Weight group significantly decreased their weight compared with participants in the Physical Activity group ($p=0.005$) over the medium-term. Participants in the Healthy Weight group with a body mass index ≥ 25 kg/m² had a mean weight loss of 1.6 kg compared with participants in the Physical Activity group who lost a mean of 0.4 kg. Nineteen percent of Healthy Weight participants lost 4.0 kg or more (approximately 5% body weight) compared with 11% of Physical Activity participants.

Economic Evaluation

Economic evaluation is the systematic comparison of costs and outcomes (benefits) of alternative interventions, services or programs. First the incremental effectiveness of the alternatives is determined, that is the additional benefit associated with a new intervention is calculated relative to an existing intervention, current practice, or, as in this case, another new intervention. Second, the incremental cost is determined, by estimating the difference in costs between the new and the comparator interventions. The incremental cost-effectiveness is calculated using the following:

$$ICER = \frac{Cost_{New} - Cost_{Comparator}}{Effectiveness_{New} - Effectiveness_{Comparator}}$$

This type of analysis typically generates an incremental cost-effectiveness ratio (ICER) which can be compared to one or more willingness-to-pay thresholds. Cost-utility analysis is the preferred method for comparing costs and outcomes (effectiveness) across interventions and/or across settings, because it uses a generic measure of effectiveness. The most

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