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Research

Gym-based exercise was more costly compared with home-based exercise with telephone support when used as maintenance programs for adults with chronic health conditions: cost-effectiveness analysis of a randomised trial

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KEY WORDS

Chronic disease
Exercise
Adult
Economic evaluation
Physical therapy

ABSTRACT

Question: What is the comparative cost-effectiveness of a gym-based maintenance exercise program versus a home-based maintenance program with telephone support for adults with chronic health conditions who have previously completed a short-term, supervised group exercise program? **Design**: A randomised, controlled trial with blinded outcome assessment at baseline and at 3, 6, 9 and 12 months. The economic evaluation took the form of a trial-based, comparative, incremental cost-utility analysis undertaken from a societal perspective with a 12-month time horizon. **Participants**: People with chronic health conditions who had completed a 6-week exercise program at a community health service. **Interventions**: One group of participants received a gym-based exercise program and health coaching for 12 months. The other group received a home-based exercise program and health coaching for 12 months with telephone follow-up for the first 10 weeks. **Outcome measures**: Healthcare costs were collected from government databases and participant self-report, productivity costs from self-report, and health utility was measured using the European Quality of Life Instrument (EQ-5D-3L). **Results**: Of the 105 participants included in this trial, 100 provided sufficient cost and utility measurements to enable inclusion in the economic analyses. Gym-based follow-up would cost an additional AUD491,572 from a societal perspective to gain 1 quality-adjusted life year or 1 year gained in perfect health compared with the home-based approach. There was considerable uncertainty in this finding, in that there was a 37% probability that the home-based approach was both less costly and more effective than the gym-based approach. **Conclusion**: The gym-based approach was more costly than the home-based maintenance intervention with telephone support. The uncertainty of these findings suggests that if either intervention is already established in a community setting, then the other intervention is unlikely to replace it efficiently. **Registration**: ACTRN12610001035011. **[Jansons P, Robins L, O'Brien L, Haines T (2018) Gym-based exercise was more costly compared with home-based exercise with telephone support when used as maintenance programs for adults with chronic health conditions: cost-effectiveness analysis of a randomised trial. *Journal of Physiotherapy* XX: XX–XX]**

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Introduction

Chronic conditions that are related to physical inactivity, such as coronary heart disease, type II diabetes and stroke, are estimated to result in direct healthcare costs of over AUD377 million per year in Australia.[1,2] Implementing strategies to increase physical activity in adults with chronic health conditions may be an effective way of reducing the economic impact in Australia. Short-term (ie, 4 to 6 week) supervised interventions, such as cardiac and pulmonary phase II rehabilitation programs, have been shown to be effective in improving quality of life and reducing morbidity and healthcare costs.[3,4] However, there is evidence to suggest that once the program is completed, adherence to exercise declines along with the health benefits obtained.[5] Hence, there is a need to provide interventions to promote long-term exercise adherence after the completion of a short-term exercise program.

A recent review of this field identified two commonly investigated approaches to improve ongoing exercise adherence for adults with chronic health conditions: home-based exercise programs with telephone follow-up, and gym-based exercise programs.[6] That review and meta-analysis found no difference in exercise adherence rates between these interventions. Furthermore, it identified no economic evaluations examining the comparative efficiency of the two approaches.

There is an ongoing need to identify efficient means of promoting adherence to exercise in the long term, in order to improve the quality of life of adults with chronic health conditions. The aim of the current study was to examine the economic efficiency of home-based maintenance with telephone follow-up

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compared with gym-based maintenance exercise amongst adults with a variety of chronic conditions who had completed a short-term supervised exercise program led by a health professional.

Therefore, the study question for this economic analysis of that randomised trial was:

> What is the comparative cost-effectiveness of a gym-based maintenance exercise program versus a home-based maintenance program with telephone support for adults with chronic health conditions who have previously completed a short-term, supervised group exercise program?

Method

Design

This economic evaluation was a comparative, trial-based, incremental cost-utility analysis conducted from a societal perspective. It used data collected as part of a single-centre, two-arm, comparative effectiveness, randomised, controlled trial with a 12-month follow-up time horizon. A detailed description of trial design, participants, interventions, and outcomes has previously been published.[7] A brief description of these methods is now provided.

Participants

Participants in the trial (n = 105) were recruited from a pool of adults who had completed a 6-week exercise program supervised by exercise physiologists at Cardina Casey Community Health Service, which is a publicly funded, community health service in Melbourne, Australia. The characteristics of the participants are presented in Table 1.

Interventions

Participants allocated to the gym-based intervention were given a 12-month individualised gym-based exercise program and health coaching[8] supervised by an exercise physiologist trained in the Health Coaching Australia model from the Cardina Casey Community Health Service. This exercise physiologist had been involved in providing the short-term, supervised exercise program conducted earlier at Cardina Casey Community Health Service. Participants were required to pay the standard casual entry fee of AUD5 per visit to the gym. The home-based intervention with telephone support group were given a 12-month individualised home-based exercise program and health coaching.[8] The same exercise physiologist who provided the gym-based program also provided the home-based intervention. The participants' home-based exercise program was monitored via five telephone calls over the first 10 weeks, each approximately 30 minutes in duration. The total time in minutes to complete the five phone calls for each participant was intended to be comparable to that spent supervising each participant in the gym over a 12-month intervention period. All participants were encouraged to complete a 1-hour exercise session, as prescribed by the exercise physiologist, three times per week.

Table 1
Baseline characteristics of participants.

Characteristic	Home (n = 49)	Gym (n = 51)	Not included in data set (n = 5)
Age *(yr)*, mean (sd)	66 (13)	65 (11)	70 (11)
Gender, n female (%)	38 (78)	27 (53)	2 (40)
Marital status, n (%)			
married	29 (59)	41 (80)	3 (60)
widowed	12 (24)	2 (4)	0 (0)
divorced	4 (8)	7 (14)	0 (0)
separated	3 (6)	1 (2)	0 (0)
never married	1 (2)	2 (4)	0 (0)
Country of birth, n (%)			
Australia	30 (61)	39 (76)	4 (80)
United Kingdom	4 (8)	3 (6)	0 (0)
other	15 (31)	9 (18)	1 (20)
Medical conditions, n (%)			
congestive heart failure	11 (22)	11 (22)	2 (40)
other heart disease[a]	43 (88)	46 (90)	3 (60)
stroke[b]	8 (16)	10 (20)	3 (60)
cancer	11 (22)	6 (12)	0 (0)
osteoporosis or osteopenia	2 (4)	4 (8)	0 (0)
depression or anxiety	19 (38)	21 (41)	3 (60)
arthritis	19 (39)	20 (39)	2 (40)
diabetes	11 (22)	21 (41)	1 (20)
lung disease[c]	23 (47)	12 (24)	1 (20)
Parkinson's disease	1 (2)	0 (0)	0 (0)
inner ear dysfunction[d]	2 (4)	4 (8)	1 (20)
cataracts	0 (0)	0 (0)	0 (0)
other visual impairment	11 (22)	9 (18)	2 (40)
broken bone since turning 60	10 (20)	6 (12)	3 (60)
joint replacement	15 (31)	16 (31)	2 (40)
Health service indicator, mean (SD)			
hospitalised for ≥ 1 night in past 3 months	0 (0)	0 (0)	0 (0)
Health insurance status, n (%)			
private health insurance	11 (22)	14 (27)	0 (0)
Department of Veterans' Affairs	1 (2)	3 (6)	0 (0)

Gym = gym-based exercise, Home = home-based exercise with telephone support.
[a] Includes coronary heart disease, cardiomyopathy, ischaemic heart disease, hypertensive heart disease, inflammatory heart disease, disease affecting one or more valves of the heart, and heart murmur.
[b] Includes stroke, mini-strokes, aneurisms, and transient ischaemic attacks.
[c] Includes asthma, emphysema, chronic obstructive pulmonary disease, and chronic obstructive airways disease.
[d] Affecting balance, eg, dizziness.

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