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Calculating the costs of an 8-week, physiotherapy-led exercise intervention in deconditioned cancer survivors in the early survivorship period (the PEACH trial)

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Abstract

Strong evidence exists for rehabilitation programmes following a cancer diagnosis, although little is known about their cost. The effects of an 8-week, physiotherapy-led, structured group intervention during the early survivorship phase were evaluated. Significant changes in quality of life and fatigue, and promising changes in fitness were found. The overall cost for this programme was €196 per participant, including the salaries of the clinicians, overheads and equipment costs. The modest costs associated with this programme may support more routine ‘cancer rehabilitation’, although more robust analyses are required.

Keywords: Cost analysis; Cancer; Randomised controlled trial; Quality of life; Fatigue

<A>Introduction

The case for routine structured rehabilitation regimens is well established in areas of medicine such as cardiology and pulmonary disease. Although the evidence in favour of exercise rehabilitation programmes in cancer settings is well established [1–5], rehabilitation regimes are not offered routinely to cancer survivors, and little is known about the cost of these programmes.

A study was undertaken to examine the feasibility and efficacy of an 8-week exercise intervention in deconditioned cancer survivors, 2 to 6 months after completion of chemotherapy. This randomised controlled trial has been described in detail elsewhere [6,7]. In summary, the results indicated that the programme was well received by participants, with high recruitment (81%) and adherence rates (78%). Significant differences in favour of the exercise group (Table 1) were found for the quality-of-life subset of physical well-being ($P=0.03$), with longer-term changes in fatigue ($P=0.01$) and physical functioning ($P=0.01$). Physiologically meaningful differences in aerobic fitness between the exercise and usual care groups were also observed, although these did not reach significance.

<insert Table 1 near here>

To the authors' knowledge, this is the first study to perform an analysis of the costs of an exercise intervention within the cancer setting. This paper reports the cost per participant of an 8-week, physiotherapy-led intervention in terms of staff, overheads and equipment costs.

<A>Methods

Data on staff costs were estimated using pro-rata calculation, based on the net costs of a senior physiotherapist (€1,677) and physiotherapy assistant (€3,056) within the Irish healthcare system (2013 data). The duration of each exercise class was 1 hour (16 classes per programme). Salary calculations allowed for 1.5 hours for each class to allow for incidental time at the beginning and end of the class, in addition to 2 hours of administration per week. Overhead costs were calculated using the PSSRU UK (2011) methodology [8], which states that overhead or non-staff costs add an extra 42% of direct care salary costs. They include costs to the provider for office, travel/transport, telephone, education and training, supplies and services (clinical and general), and utilities (i.e. water, gas and electricity). The total cost of equipment, including a rowing machine, treadmill and bike for the exercise intervention, was €969. An annual equivalent cost was calculated using an expected lifetime of 10 years and a discount rate of 5%.

<A>Results

The results are summarised in Table 2. The total staff cost for a senior physiotherapist and assistant for the duration of the programme was calculated to be €2784. Hence, the total overhead cost was estimated to be €158 for the total intervention group and €55 per patient. An annual equivalent cost for the equipment was calculated at €644, and €161 for the 3-month duration of the trial. The average cost of the equipment per patient was €8.

<A>Discussion

Although strong evidence exists for exercise interventions within cancer, data on the cost of these programmes are in their infancy. The study protocols of two randomised controlled trials [9,10], including an economic evaluation, have been described; however, results from these have yet to be published, and therefore there are no other descriptions with which to

compare the costs calculated in the present study. As an aspect of the feasibility analysis of the PEACH trial, it was calculated that the overall costs for the 8-week, hospital-based, group intervention were €196 per participant, including the salaries of the clinicians, overheads and equipment costs.

Physiotherapists working in cancer rehabilitation should be more aware of the cost of running rehabilitation programmes such as described in this study. For a minimal cost per participant, this study showed significant changes in quality of life and fatigue, and promising changes in fitness. However, this study had a number of limitations. Resource utilisation, such as drugs and non-scheduled hospital appointments, was not explored. Quality-adjusted life years were not calculated as survival information was not available. Indirect costs borne by the community (wider societal costs) were not included (i.e. potential lost productivity as a result of attending the programme, although it could be argued that anything which improves quality of life and reduces fatigue could also increase productivity). This analysis was undertaken in the Irish healthcare setting; costs in other countries may differ.

The case for routine ‘cancer rehabilitation’ has yet to be made. While this was a rudimentary evaluation based on salaries, overheads and equipment costs, it provides preliminary information outlining the modest costs of this physiotherapy-led programme. Findings from this study will provide useful information for physiotherapy managers, investigators who are conducting exercise trials in cancer populations, policy makers and grant-awarding bodies.

Ethical approval: Research Ethics Committee of the Adelaide and Meath Hospital incorporating the National Children's Hospital/St. James's Hospital.

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Conflict of interest: None declared.

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Table 1

Effects of exercise intervention vs usual care on quality-of-life and fatigue outcomes at baseline, post intervention (8 weeks) and follow-up (3 months)

		Baseline	8 weeks	3 months	Change from baseline to 8-week follow-up	p value
		Mean (SD)	Mean (SD)	Mean (SD)	Mean difference (95% CI)	
FACT-G						
Physical well-being subset	Exercise group	21.3 (5.1)	24.7 (3.3)	24.0 (4.6)	3.7 (1.6 to 5.7) ^a	0.03 ^b
	Usual care group	23.4 (2.4)	24.1 (2.8)	23.7 (3.4)	0.9 (-0.2 to 1.9)	
FACIT-F						
Fatigue subscale	Exercise group	35.3 (11.3)	41.2 (9.3)	42.0 (9.2)	6.2 (2.1 to 10.3) ^a	0.16
	Usual care group	40.2 (9.4)	42.1 (9.3)	37.7 (13.3)	2.3 (-0.5 to 5.1)	
FACIF-F total score	Exercise group	121.5 (24.6)	131.2 (20.8)	134.1 (21.8)	11.0 (3.3 to 18.6)	0.42
	Usual care group	131.7 (15.9)	137.6 (17.9)	133.4 (23.4)	6.5 (1.3 to 11.7)	
TOI-F						
	Exercise group	79.1 (19.2)	88.5 (15.8)	89.0 (16.4)	10.3 (3.8 to 16.8) ^a	0.15
	Usual care group	85.9 (13.4)	90.3 (13.0)	85.2 (17.4)	4.7 (0.5 to 8.9)	

FACT, Functional Assessment of Cancer Therapy-General Questionnaire; FACIT-F, Functional Assessment of Chronic Illness Therapy Fatigue Scale; TOI-F, Trial Outcome Index-Fatigue; SD, standard deviation; CI, confidence interval.

Exercise group: baseline ($n=23$), 8 weeks ($n=21$), 3 months ($n=20$). Control group: baseline ($n=20$), 8 weeks ($n=19$), 3 months ($n=18$).

P for analysis of covariance comparing changes between the exercise group and the usual care group from baseline to 8-week follow-up and baseline to 3-month follow-up.

^aClinically meaningful change.

^b $P<0.05$.

Table 2

Total costs of the PEACH trial

	Intervention total	Intervention per patient ^a
Staff	€2784	€133
Overheads (@ 42%)	€1158	€55
Equipment	€161	€8
Total	€4103	€196

^aBased on 21 participants who completed the 8-week exercise intervention.