



Clinical paper

An intervention for cardiac arrest survivors with chronic fatigue: A feasibility study with preliminary outcomes



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ABSTRACT

Aim: The primary aim was to examine the feasibility of recruiting and retaining participants for an Energy Conservation + Problem Solving Therapy (EC + PST) intervention delivered over the telephone, to evaluate the acceptability of the intervention, and to assess the appropriateness of the outcome measures. The secondary aim was to evaluate the preliminary intervention effect on fatigue impact, activity performance, and participation in daily activities in post-cardiac arrest (CA) adults with chronic fatigue.

Methods: This feasibility study used a prospective, pre-post experimental design. Individuals who were at least 3 months post-CA with moderate-to-severe fatigue were eligible to participate. By participating in EC + PST intervention sessions, participants learned how to apply EC strategies to solve their fatigue-related problems. Participants were assessed before and after completing the intervention using outcome measures assessing fatigue, activity performance, and participation in daily activities.

Results: Eighteen CA survivors with chronic fatigue successfully completed the intervention and the assessments with high satisfaction. We observed a 15% recruitment rate and ceiling effects on two outcome measures of perceived-performance in daily activities. Significant decreases in the impact of physical ($p = .001$) and cognitive ($p = .006$) fatigue of CA survivors were observed with small to moderate effect sizes of $r = 0.23$ – 0.25 after receiving the EC + PST intervention.

Conclusion: The delivery of EC + PST intervention over the telephone is feasible, and the intervention is highly acceptable to CA survivors with chronic fatigue. Also, the EC + PST intervention seems promising in reducing the impact of physical and cognitive fatigue of CA survivors.

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Introduction

Cardiac arrest (CA) is common and often deadly, resulting in approximately 325,000 deaths annually in North America,¹ and only 10% of those who experience an out-of-hospital CA survive.² Survivors often experience problems with memory, attention, mood, physical ability, fatigue, participation, and quality of life.^{3–6} Prolonged complaints of fatigue are common in post-CA adults, with more than half experiencing moderate-to-severe fatigue 3 years post CA.⁶ Chronic fatigue is a general and sustained feeling of exhaustion or difficulty performing physical and mental activities for days to weeks, which is not resolved by rest.⁷ Chronic fatigue negatively affects cognitive, physical, and emotional functions,

activities of daily living, participation, and quality of life.^{8–10} Despite its prevalence and the known negative impact of chronic fatigue,^{6,8} no pharmacological or non-pharmacological interventions are recommended for managing fatigue or improving daily activities in people with post-CA chronic fatigue. Therefore, an intervention to improve daily activities, by means of fatigue management in post-CA adults, is urgently needed.

Prior to a clinical trial of any therapy, it is necessary to evaluate the feasibility of delivering interventions and of measuring relevant outcomes.¹¹ The primary aims of this feasibility study were to determine (1) the feasibility of recruiting and retaining participants, (2) the feasibility of delivering an Energy Conservation + Problem Solving Therapy (EC + PST) intervention over the telephone, (3) the acceptability of the intervention to individuals who experience chronic fatigue, and (4) the appropriate outcome measures to capture fatigue impact, activity performance, and participation level in this population. The secondary aim was to

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Table 1
Participant criteria and rationales.

Criteria	Rationale for the criteria
•At least 3 months post-CA	At 3 months post-CA, individuals are no longer considered in an acute stage ¹⁶ and were likely to have opportunities to return to their previous lives.
•Presence of moderate-to-severe fatigue: ≥ 4 score on the FSS	Participants had to have moderate-to-severe fatigue at pretest to show change at posttest. A score ≥ 4 on the FSS was considered as having moderate-to-severe fatigue.
•Availability of landline telephone or cell phone	Because the intervention would be delivered by telephone, individuals needed access to any type of telephone.
•Living within 150 miles of the University of Pittsburgh, Oakland	Because pretest assessments were conducted in participants' homes, individuals needed to live no further than 150 miles from the Oakland campus of the University of Pittsburgh.
•Functional English fluency and literacy	To understand the content of consultations and information in the Participant Workbook, individuals had to have functional English fluency and literacy.
•Intact cognition	To understand the Participant Workbook and follow the procedures of the EC + PST intervention, participants needed to have intact cognition.
•Community living	Individuals living in the community have the opportunity to encounter more problems from chronic fatigue than those in institutions

CA: cardiac arrest. FSS: Fatigue Severity Scale. EC + PST: Energy Conservation + Problem Solving Therapy.

evaluate the preliminary intervention effect on outcome measures of fatigue impact, activity performance, and participation level in post-CA adults.

Methods

Design

A prospective, pre-post cohort design was used for this study. After the pretest, participants received the EC + PST intervention for up to 4 weeks. The posttest occurred at Week 5.

Participants

Individuals who were at least 3 months post-CA and had chronic fatigue were eligible to participate in the study (Table 1).

EC + PST intervention

Energy Conservation (EC) education promotes fatigue management and improvement in daily activity performance in individuals with chronic fatigue.¹² EC incorporates strategies, such as taking rest periods, controlling the pace of work, and arranging supplies within normal reach.^{13,14} In this study, we taught participants EC strategies using Problem Solving Therapy (PST) as a framework.¹⁵ PST consists of seven steps: (1) identifying and defining the problem, (2) establishing realistic and achievable goals for problem resolution, (3) generating multiple solution alternatives through brainstorming, (4) evaluating each solution by weighing potential positive and negative consequences to choose the best solutions, (5) developing a detailed solution plan, (6) implementing the preferred solution plan, and (7) assessing the outcome and modifying the solution plan as needed.

Procedures

Following approval of the study by the University of Pittsburgh Institutional Review Board (PRO09110375), clinical staff (emergency medicine physicians, occupational therapists, physical therapists, exercise physiologists) referred potential participants with a CA history and self-reported fatigue from the UPMC Post-CA Care Service, follow-up clinics, inpatient and outpatient hospital units, or rehabilitation centers. Following verbal consent, individual eligibility was assessed using the criteria in Table 1. For screening cognition and English fluency, individuals had to correctly answer four questions: (1) What is the purpose of this study? (2) What is your role in this study? (3) How many times will you be assessed in this study? and (4) How will the EC-PST intervention be delivered to

you? Eligible participants provided informed consent and participated in pretest measures. At pretest, demographic and medical information were collected from the medical chart, and descriptive and outcome measures were collected by trained assessors. At posttest, outcome measures were administered by trained assessors who were masked to the study purposes and pretest scores. Pretest data were collected in person; posttest data by telephone. The same response sheets and directions were used for pretest and posttest, and clarification of questions and directions was provided during the tests to minimize misinterpretation.

The EC + PST intervention was administered by an investigator (YJK) trained in PST and having expertise in EC + PST. The intervention was delivered by telephone. Each EC + PST intervention session was planned to last approximately 45 min and occur twice a week for up to 4 weeks. Sessions terminated when the participants identified and solved two fatigue-related problems of their choice or had participated in the intervention for eight sessions. A Participant Workbook was used throughout the intervention (Table 2). At the conclusion of pretesting, the investigators reviewed the contents of the Participant Workbook and asked participants to read the introduction section before Session 1. Investigators asked participants to identify fatigue-related problems that prevented them from participating in everyday life prior to Session 1; this was typically held within a week of the pretest. During Session 1, the fatigue-related problems identified by participants were discussed. Participants prioritized the two fatigue-related problems that they wanted to work on during the EC + PST intervention. During Session 2, participants practiced the steps of the EC + PST intervention with problem 1. By the end of Session 2, a clearly defined action plan for solution implementation was identified.

Table 2
Table of contents of the Participant Workbook.

Contents
1. Contact information for research team with their pictures
2. Introduction of the EC + PST intervention
3. Structure of the participant workbook
4. Ground rules for sessions
5. Facts regarding fatigue after cardiac arrest
6. Fatigue – a vicious cycle
7. Budgeting and banking energy; making active choices about activities you are going to do
8. EC + PST intervention steps
Modifying activities
MODE (Method, Objective, Device, Environment) method
The importance of rest
Communicating with family and friends about fatigue
9. Balancing your schedule
10. Work sheets for use during sessions

EC + PST: Energy Conservation + Problem Solving Therapy.

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