

# Role of Physiotherapy in Management of Cancer Related Pain and Fatigue During Palliative Care- A Review

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## Abstract

### Background and Purpose of the Study

*Management of cancer related pain and fatigue in cancer patients requires a multidisciplinary approach. The purpose of the review is to find out the role of exercises in reducing cancer related pain and fatigue levels in cancer patients. Palliative care is the multidisciplinary therapeutic approach for people with life limiting illness. It focuses on providing relief from symptoms such as pain, fatigue, physical stress and mental stress at any stage of illness. There has been limited research conducted to investigate the importance of role of physiotherapy in palliative care setting. So, the purpose of this study is to contribute a review to the current research involving the importance of physiotherapy during palliative care in management of pain and cancer related fatigue in cancer patients in terms of its efficacy, value, and how this value is perceived by patients and their caregivers.*

*Methods: This study was completed by independently screening and reviewing the eighteen year studies that were published between the years 2000 to 2018 related to the role of physiotherapy during palliative care in management of cancer related pain and fatigue in cancer patients. The databases and journals searched included Google Scholar, PUBMED, MEDLINE and PEDro.*

*Results: Throughout all of the 15 reviewed articles, it was reported that physiotherapy results in improvements in a variety of aspects of patient's functions and relief of symptoms. The most frequently described benefit after receiving physiotherapy care were decrease in cancer related pain and fatigue levels. These benefits signify the valuable role that physiotherapy plays in caring for patients during palliative care and the impact it can have on patients' functions and symptom management.*

**Keywords:** Palliative care, Cancer, Fatigue, Pain.

## Introduction

Cancer-related fatigue (CRF) is a serious problem that affects the majority of patients with cancer. Increasing evidence indicating role of exercises in alleviating cancer related symptoms including pain and fatigue. One of the latter definitions of cancer related fatigue has been set up by the National Comprehensive Cancer Network (NCCN) "Cancer-related fatigue is a distressing, persistent, subjective sense of tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual functioning"(1). This symptom occurs frequently and 80% of all cancer patients experience the symptom as troublesome. During chemotherapy treatment more than 99% of the patients state that they are bothered by fatigue. Fatigue has a very negative impact on the quality of life of these patients. CRF is a reported side effect of all types of cancer treatment affecting nearly 100% of cancer survivors and persists for years after treatment cessation. CRF impacts on all dimensions of quality of life and is the number one cause of reduced activities of daily living in cancer patients. Cancer survivors often state that CRF is the most distressing symptom related to cancer or cancer treatment, more so than pain, nausea, and vomiting. Pain is a common symptom with patients in an advanced stage of cancer disease and it forms the entire life situation for the patient. The pain is often caused by the cancer disease and the location of the tumor and the metastasis. Radiation and chemo therapy treatment can cause both acute and a more continuing pain but can also relieve pain in a late palliative phase of the disease. This means that the pain might not be just physical but can also have psychological, social and existential dimensions (2). Physiotherapy plays a very important role to provide the best possible quality of life for the palliative patient and their family for the rest of the time. Physiotherapy is concerned with identifying and maximizing the quality of life and the movement potential within the spheres of promotion, prevention, treatment/intervention, and rehabilitation. This encompasses the physical, psychological, emotional, and the social wellbeing. Physiotherapy involves the interaction between the PT, patients/clients, other health professionals, families, care givers and communities, in a process where the movement potential is assessed and goals are agreed upon, by using the knowledge and the skills which are unique to the physiotherapist.

The purpose of this review was to determine the effect of physiotherapy during palliative care on cancer related pain and fatigue.

## Methods:

There are number of studies which support the importance of physiotherapy during palliative care specifically for pain and fatigue but there are less review of literature content available to conclude the importance of physiotherapy during palliative care on cancer related pain and fatigue. This study was completed by independently screening and reviewing the eighteen year studies that were published between the years 2000 to 2018 related to the role of physiotherapy during palliative care in management of cancer related pain and fatigue. The databases and journals searched included Google Scholar, PUBMED, MEDLINE and PEDro up to August 2018.

**Study inclusion**

All articles retrieved from the updated search were reviewed independently by the reviewers to identify the studies that met the inclusion criteria of:

- (i) Randomized controlled trial or randomized cross-over trial;
- (ii) Studies must be published in English;
- (iii) Studies published between 2000 to 2018 were included in the study.

**Summary of the included studies:****Ryutaro Matsugaki et al, 2018:**

Ryutaro Matsugaki et al (3) retrospectively investigated the immediate effects of exercise on cancer related fatigue in cancer patients. Eighteen cancer patients who performed exercise therapy targeting a rating of 4 on the Borg category ratio scale were enrolled. CRF was evaluated by cancer fatigue scale (CFS). CFS was evaluated in clinical practice immediately before and after exercise therapy in the form of leg strength and walking training on the 1<sup>st</sup> or 2<sup>nd</sup> day of physiotherapy for CRF management. CFS scores before and after exercises were compared to determine how CRF changed due to exercise therapy. CFS physical, CFS affective, CFS cognitive, and CFS total all decreased following exercise therapy, and the changes in CFS physical and CFS total were statistically significant. CFS total decreased after exercise in 12 from 18 patients. These results suggest that exercise therapy immediately reduces CRF in cancer patients undergoing treatment.

**Markus k.schuler et al, 2017:**

Markus k.schuler et al (4) using a randomized control trial, describe the effects of physical exercise in alleviating cancer related fatigue. In this study, seventy seven patients are invited to participate in RCT exploring the effects of exercise on fatigue 12 to 24 weeks after baseline. Patients were randomized into three groups. Group A received pharmacological treatment as usual, group B was taught a structured, individual sports program, and group C received additional ambulatory physiotherapeutical supervision. Primary outcome was fatigue and secondary outcomes are dimensions of (MFI) Multidimensional fatigue inventory and walking distance. The results of this study indicated reduction of rate of severe fatigue in group C, there was significant changes in dimensions of MFI.

**Anna Pyszora et al, 2017:**

Similarly, Anna Pyszora et al (5) using a RCT model, evaluated the effect of a physiotherapy programme on CRF and other symptoms in patients diagnosed with advanced cancer. The study included 60 patients (n = 60). Participants were randomized into the therapy group and the control group at the ratio of 1:1. The primary outcomes were use to measure the severity of fatigue and its impact on daily functioning and well-being (Brief Fatigue Inventory—BFI) and intensity of other symptoms associated with the disease (Edmonton Symptom Assessment Scale—ESAS). The physiotherapy programme included active exercises of the upper and lower limbs, selected techniques of myofascial release (MFR) and selected techniques of proprioceptive neuromuscular facilitation (PNF). It was found that physiotherapy program significantly reduced fatigue severity in patients evaluated using the BFI. No significant differences were observed regarding ESAS parameter values between the groups. The results of the present study clearly demonstrate that cancer-related fatigue in patients with advanced cancer constitutes an indication for the inclusion of physiotherapy in their non-pharmacological treatment.

**Renu B Pattanshetty et al, 2016:**

Renu B Pattanshetty et al supported the role of physiotherapy in cancer patients by giving review on Role of Physiotherapy in Cancer- Related Fatigue in Cancer Survivors (6). Clinical trials have shown that physical activity in the form of brisk walking is beneficial in minimizing the effect of psychological effects by reducing the fatigue levels, depression, anxiety and enhancing the quality of life in cancer survivors. It also supports recent advances in cancer screening and treatment which have resulted in an expanding number of cancer survivors This study suggests the physical activity in the form of aerobic exercises, yoga, pilates, taichi, resistance exercises and acupuncture has proved to be effective in cancer survivors experiencing cancer related fatigue, psychological factors and also in improving quality of life.

**Jose F Meneses Echavez et al, 2015:**

Similarly, Jose F Meneses Echavez et al also gave a systematic review with meta-analysis of randomized trials.(7) Supervised physical activity interventions (e.g., aerobic, resistance and stretching exercise), defined as any planned or structured body movement causing an increase in energy expenditure, designed to maintain or enhance health-related outcomes, and performed with systematic frequency, intensity and duration. Outcome measures: The primary outcome measure of this study was fatigue. Secondary outcomes were physical and functional wellbeing assessed using the Functional Assessment of Cancer Therapy Fatigue Scale, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire, Piper Fatigue Scale, Schwartz Cancer Fatigue Scale and the Multidimensional Fatigue Inventory. Eleven studies involving 1530 participants were included in the review. The assessment of quality showed a mean score of 6.5 (SD 1.1), indicating a low overall risk of bias. The pooled effect on fatigue, calculated as a standardized mean difference (SMD) using a random-effects model, was -1.69 (95% CI -2.99 to -0.39). Beneficial reductions in fatigue were also found with combined aerobic and resistance training with supervision (SMD = -0.41, 95% CI -0.70 to -0.13) and with combined aerobic, resistance and stretching training with supervision (SMD = -0.67, 95% CI -1.17 to -0.17). This study showed that supervised physical activity interventions reduce cancer-related fatigue. These findings suggest that combined aerobic and resistance exercise regimens with or without stretching should be included as part of rehabilitation programs for people who have been diagnosed with cancer.

**Anne Marie Lunde Husebø et al, 2014:**

Using a RCT model, Anne Marie Lunde Husebo et al (8) investigated effects of a scheduled home-based exercise intervention in breast cancer patients during adjuvant chemotherapy, on cancer-related fatigue, physical fitness, and activity level. Sixty-seven women were randomized to an

exercise intervention group ( $n = 33$ , performed strength training 3x/week and 30 minutes brisk walking/day) and a control group ( $n = 34$ , performed their regular physical activity level). Exercise levels were slightly higher in the scheduled exercise group than in the control group. In both groups, cancer-related fatigue increased at Post1(completion of chemotherapy) but returned to baseline at Post2(6 month post chemotherapy). Physical fitness and activity levels decreased at Post1 but were significantly improved at Post2. The findings suggest that generally recommended physical activity levels are enough to relief cancer-related fatigue and restore physical capacity in breast cancer patients during adjuvant chemotherapy.

#### **Franziska kummer et al, 2013:**

In a study, Franziska kummer et al (9) examined the relationship between cancer-related fatigue and physical activity in the course of inpatient rehabilitation. Fatigue (Multidimensional Fatigue Inventory) and physical activity (Freiburg Questionnaire of Physical Activity) were assessed in a consecutive series of 35 patients with cancer attending oncological inpatient rehabilitation during a six-month study period. The three- week rehabilitation program included daily exercise therapy consisting of aerobic endurance training, moderate resistance training, coordination exercises, relaxation training and individual physiotherapy. The results of this study showed that there were significant improvement in each dimension of cancer- related fatigue ( $p=0.001-0.003$ ) and a significant increase of physical activity levels ( $p=0.001$ ) of the patients at discharge.

#### **Karen M. Mustian et al, 2013:**

Karen M. Mustian et al (10) suggested the role of exercise in reducing side effects like CRF, pain, sleep problems, etc, and improves QOL for cancer patients during treatment and recovery. Exercise prior to, during, and after completion of cancer treatments provides numerous beneficial outcomes. Aerobic exercises like walking, running, cycling, and swimming, resistance training, and mindfulness are beneficial when performed by cancer patients who are undergoing treatment. This study strongly indicates the benefits of aerobic exercises, resistance training and mindfulness based exercises in reducing side effects of cancer treatment in cancer patients.

#### **Adam Hurlow et al, 2012:**

Adam Hurlow et al (11) gave a systemic review by including randomized controlled trials(RCTS) investigating the use of TENS for the management of cancer-related pain in adults. This is an update of the original review published in Issue 3, 2008. This review now includes a total of three RCTs. It only included study that evaluated TENS administered using a standard TENS device that delivered monophasic or biphasic pulsed electrical currents in the mA range. Pain intensity and pain relief, at rest and on movement, were measured using Numerical (NRS) and Verbal Rating Scales (VRS). Only one RCT, in addition to the two RCTs identified by the initial review, met the inclusion criteria for review. There is insufficient evidence to judge whether TENS should be used in adults with cancer-related pain. Further research is needed to improve knowledge in this field.

#### **Justin C. Brown et al, 2010:**

Justin C. Brown et al (12) also used randomized controlled trials (RCT) that examined the effects of exercise on CRF in adult patients (more than 18 years) diagnosed with any type of cancer. The outcome variable examined was patient-reported CRF, which studies assessed either separately or as a component of a comprehensive psychological questionnaire with a CRF subscale. In total, 44 studies with 48 interventions qualified, including 3,254 participants of varying cancer types, stages of diagnosis, treatments, and exercise interventions. Cancer survivors in exercise interventions reduced their CRF levels to a greater extent than usual care controls,  $d=0.31$  (95% CI 0.22–0.40), an effect that appeared to generalize across several types of cancer. CRF levels improved in direct proportion to the intensity of resistance exercise ( $b=0.60$ ,  $P=0.01$ ), a pattern that was stronger in higher quality studies ( $b=0.23$ ,  $P < 0.05$ ). CRF levels also reduced to a greater extent when interventions were theoretically driven ( $b=0.48$ ,  $P < 0.001$ ) or cancer survivors were older ( $b=0.24$ ,  $P=0.04$ ). This study indicates the effect of Exercise in reducing CRF especially in programs that involved moderate-intensity, resistance exercise among older cancer survivors.

#### **Michael I Bennett et al, 2010:**

Similarly by using a RCT model, Michael I Bennett et al (13) assessed a feasibility of TENS in cancer bone pain patients. Eligible patients received active TENS and placebo effect for 1 hour at the site of pain, between a interval of 3days. Twenty four patients were randomized. The interventions of this study were well tolerated. Outcomes measures were difference in active TENS and placebo effect. This study suggests that TENS has a potential to decrease pain on movement more than pain on rest. Nine patients didn't consider placebo TENS and remaining patients consider the placebo TENS.

#### **Caroline M. Donnelly et al, 2009:**

Caroline M. Donnelly et al (14) developed a cross-sectional, self-administered, postal questionnaire to establish physiotherapy management of CRF. All physiotherapist members of the UK Association of Chartered Physiotherapists in Oncology and Palliative Care (ACPOPC) received a questionnaire. The questionnaire contained 59 items, divided into four sections, entitled (a) Therapists' Professional Profile, (b) CRF Education, (c) CRF screening and (d) Exercise Management of CRF. Seventy-eight percent of therapists recommend and/or use exercise like low-impact exercise types, such as walking, bed- and chair- based exercises, flexibility and stretching and an exercise bicycle as part of the management of CRF; 74% teach other strategies, most commonly energy-conservation techniques (79%). Therapists recommend and/or use exercise in similar frequencies with a range of cancer types, before (32%), during (53%) and following treatment (59%) and during advanced stages of the disease (68%). This is the first study to examine the role of physiotherapists in the management of CRF. Results show current physiotherapy management of CRF has a strong focus on exercise, with 78% of respondents indicating they recommend and/or use exercise as part of the management of CRF.

**Margaret L. McNeely et al, 2008:**

Margaret L. McNeely et al(15) gave a randomized control trial. This study was designed to examine the effects of progressive resistance exercise training (PRET) on upper extremity pain and dysfunction in postsurgical head and neck cancer survivors. Fifty-two head and neck cancer survivors were assigned randomly to PRET (n 5 27) or a standardized therapeutic exercise protocol (TP) (n 5 25) for 12 weeks. The primary outcomes measure was change in patient-rated shoulder pain and disability from baseline to post intervention. Secondary outcomes measures were upper extremity strength and endurance, range of motion, fatigue, and quality of life. PRET was superior to TP for improving shoulder pain and disability (29.6; 95% confidence interval [95% CI], 216.4 to 24.5; P 5.001), upper extremity strength (110.8 kg; 95% CI, 5.4–16.2 kg; P <.001), and upper extremity endurance (1194 repetitions 3 kg; 95% CI, 10–378 repetitions 3 kg; P 5.039). The result of this study indicates the role of PRET program in significantly reducing the shoulder pain and disability and improved upper extremity muscular strength and endurance in head and neck cancer survivors.

**Mock et al, 2004:**

Mock et al (16) had examined evidence from recent (since 1997) randomized clinical trials (RCTs) regarding the effectiveness of exercise as an intervention for CRF. He compared patients with breast cancer who were participating in a 6-week walking exercise program with a group of patients with breast cancer who were receiving usual care to determine the effects of exercise on physical functioning and symptom intensity. In the 8 studies reviewed, across all training regimens, whether inpatient or outpatient (supervised or community-based), exercise was found to have a positive effect on CRF. It provides suggestions for exercise program protocols and for future research endeavors.

**Dimeo et al, 2001:**

Dimeo et al (17) suggested the effects of exercise on cancer related fatigue. He found out that there is growing evidence that physical exercise programs help prevent the manifestation and reduce the intensity of cancer-related fatigue. Endurance exercise is a promising new approach to treating cancer-related fatigue. Further studies are warranted to assess the effects of exercise programs in other settings. This article supports the actual evidence of the relationship between fatigue and impairment of physical performance in cancer patients and suggests future directions also.

**Conclusion**

This review article suggests the role of physical exercises in management of cancer related fatigue and pain in cancer patients in palliative care settings. This study confirms the largest meta-analysis of RCTs conducted to date that moderate resistance exercise reduces CRF among cancer patients. Physical activity in the form of aerobic exercises, yoga, pilates, resistance exercises, endurance training and has proved to be effective in cancer survivors experiencing cancer related fatigue, in decreasing pain levels, psychological factors and also in improving quality of life. These findings promote the role of physiotherapy in cancer patients during palliative care.

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