

Systematic Review of Rehabilitation Intervention in Palliative Care for Cancer Patients

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Abstract

Aim: Despite the gradually growing recognition of the importance of rehabilitation for cancer patients, the absolute level of awareness about rehabilitation still seems to be low in the field of cancer care, particularly in the field of palliative care for cancer patients.

Methods: We carried out a systematic review of the literature pertaining to rehabilitation intervention in palliative care for cancer patients, using the medical literature database Pub Med. The key words were “cancer,” “palliative care,” and “rehabilitation.” The search was confined to interventional studies, and review papers, case reports and papers whose main text was in a language other than English despite being appended with an English abstract were excluded.

Results: While the literature search yielded 604 published papers based on the keywords, only 8 were eligible for inclusion in this study, demonstrating the scarcity of published studies on this topic. The interventions used in these published studies placed emphasis on mental approaches rather than physical approaches based on the tradition of rehabilitation medicine. Intervention often involved group care rather than separate care for individual patients.

Conclusions: This review demonstrates the scarcity of high-evidence-level studies well founded on oncology, and provides a direction for future studies on this subject.

Keywords: Cancer; Intervention; Palliative care; Rehabilitation; Systematic review

Introduction

The history of medical rehabilitation for patients with cancer began in the 1940s in the United States [1]. In the earlier days, since the outcomes of cancer treatment administered with curative intent were poor, attempts at rehabilitation for postoperative functional recovery began to be made in patients with breast cancer [2]. At the same time, with the large number of soldiers injured during the world war, marked advances were made in rehabilitation medicine after life-saving critical care [3]. Under such circumstances, attempts at restoration of the social activity of patients who had undergone leg amputation by means of leg prostheses and gait training were analogously applied to patients after surgical treatment of osteosarcoma. However, rehabilitation for cancer patients was not extensively practiced in those days because of the low survival rate of cancer patients and the fact that the major type of cancer for which rehabilitation was considered suitable, that is, cancer of the locomotor organs, was rare, occurring at a relatively low incidence (e.g., osteosarcoma).

Now, in the 21st century, treatment of cancers has changed markedly as compared to earlier days. First of all, the survival rate of cancer patients has improved, which has led to an increase in the number of patients requiring rehabilitation to deal with functional disorders arising from curative treatment of cancer. Second, remarkable advances have also been made in active therapeutic intervention for alleviation of symptoms, i.e. palliative care. In response to this trend, in 2002, the WHO modified the definition of palliative care that was initially proposed in 1989. According to the new WHO definition, palliative care begins with the diagnosis of illness and is aimed at improving the QOL of the patients. This led to an increasing expectation of people toward the role of rehabilitation as a means of improving the QOL of patients.

For this review, the authors first investigated the degree of satisfaction of the patients and their family members with the rehabilitation provided at facilities specializing in cancer management [4]. The investigation revealed a high degree of satisfaction of cancer patients with rehabilitation in both the curative and palliative aspects. Based on this finding, the authors conducted a nationwide survey of rehabilitation for cancer patients [5]. The survey, with a response recollection rate of 62%, demonstrated that although the percentage of patients receiving rehabilitation is high at Japanese medical facilities and there is a strong need for rehabilitation (Table 1), the system for providing rehabilitation is still inadequate and no rehabilitation program specific to cancer patients is available. Thus, despite the gradually growing recognition of the importance of rehabilitation for cancer patients, the absolute level of awareness about rehabilitation still seems to be low in the field of cancer care, particularly in the field of palliative care for cancer patients.

The present study was undertaken to investigate the current status of rehabilitation intervention in palliative care through a systematic review of published studies on the efficacy of medical rehabilitation in cancer patients receiving palliative care.

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Author, Country, Journal (year)	Subjects, Cancer type	Study design	Rehabilitation team composition	Intervention methods (content, frequency, period)	Primary outcome	Major results
Bruera et al. [6]	24, Advanced cancer	Feasibility study	Nurse	Expressive writing (EW) group: Instructed to write about their most traumatic and upsetting experiences, important things about which they had deepest feelings and thoughts. Neutral writing (NW) group: Instructed to write about dietary behaviors, physical activity and exercise behaviors, substance-use behaviors, and sleep habits. Two weeks	Anxiety (State-Trait Anxiety Inventory: STAI)	The majority of patients (83%-100%) were able to complete all baseline assessments. There was no significant difference in the STAI scores at baseline, before and after each writing session between the EW and NW groups.
Miller et al. [7]	327, Advanced cancer	Retrospective study	Occupational therapist	Intervention group: Relaxation (induction script, progressive muscular relaxation, passive neuromuscular relaxation, autosuggestion, guided visualization, unguided visualization). Four sessions. Control group: None.	Pain (Visual Analogue Scale from 1 to 10)	Change in scores did gradually increase as the sessions progressed (from 2.92 in session one to 3.46 in session four).
Steinhauser et al. [8]	82, Advanced cancer	Pilot randomized control trial	Not specify	Treatment group: Met with a facilitator three times and discussed issues related life review, forgiveness, and heritage, and legacy. Relaxation meditation group: Met with a facilitator three times and listened to a nonguided relaxation CD. Control group: No intervention.	Pain and symptoms (Memorial Symptom Assessment Scale), Functional status (Rosow-Breslau ADL scale), Anxiety (Profile of Mood States subscale), Depression (Center for Epidemiologic Study of Depression), Quality of life at the end of life (QUAL-E), Daily spiritual experience (Daily Spiritual Experience Scale), Social support	Participants in the active discussion intervention showed improvements in functional status, anxiety, depression, and Quality of life for end of life.
Ruff et al. [9]	42, Spinal epidural metastasis	Controlled retrospective study	Occupational therapist, nurse, and physical therapist	Intervention group: Training in transfers, bowel and bladder care, incentive spirometry, nutrition, and skin care. Occupational therapy: 2 hours, Nurse: 2 hours, Physical therapy: 30 minutes. Two weeks. Control group: No intervention.	Pain (Numerical Rating Scale from 0 to 10), Depression (Beck Depression Inventory- Second Edition: BDI-II), Satisfaction with life (Satisfaction with Life Scale: SWLS)	Subjects who received rehabilitation had less pain, consumed less pain medication, were less depressed, and had higher satisfaction with life.
Lee et al. [10]	36, Advanced cancer	Prospective, uncontrolled study	Occupational therapist	Intervention group: Proper positioning techniques and provision of feeding aids, positioning aids or upper limb support, in accord with the patient's feeding problems. Three weeks. Control group: None.	Feeding independence (Five-point scale from 1 to 5)	There was a significant improvement in feeding independence from baseline to week 1. Multilevel models showed that there were no significant differences in the level of feeding independence between weeks 1 and 2 and between weeks 1 and 3.

Yates et al. [11]	109, Early stage breast cancer	Randomized controlled trial	Nurse	Intervention group: The psychoeducational intervention aimed to improve patients' knowledge and skills to enable them to perform self-care behaviors designed to minimize fatigue. Three individualized sessions (first session: on average, 20 minutes, second and third sessions: by phone, on average, 10 minutes. Control group: General cancer education sessions.	Fatigue (Numeric Rating Scale, Functional Assessment of Cancer Therapy-Fatigue and Piper Fatigue Scales), Self-efficacy (Cancer Self-Efficacy Scale), Quality of life (EORTC QLQ-C30 questionnaire), Psychological well-being (Hospital Anxiety and Depression Scale)	Compared with the intervention group, mean difference scores between the baseline (T1) and immediate after the test (T2) assessments increased significantly more for the control group for worst and average fatigue, Functional Assessment of Cancer Therapy-Fatigue, and Piper fatigue severity and interference measures.
Hanks et al. [12]	261, Advanced cancer	Randomized controlled trial	Clinical psychologist, social worker, rehabilitation staff, chaplaincy, specialist doctor, and specialist nurse.	Intervention group (full-PCT): Usual service delivered by the palliative care team (PCT), which comprised two clinical academic consultants, one specialist registrar and three clinical nurse specialists. Four weeks. Control group (telephone-PCT): No direct contact between the PCT and the patient or their family. Instead, a telephone consultation took place.	Quality of life (EORTC QLQ-C30 questionnaire), Symptoms (Visual Analogue Scales), Mood (Memorial Pain Assessment Card), Hospital stay, Satisfaction/dissatisfaction with care (MacAdam's Assessment of Suffering Questionnaire, Hospital Anxiety and Depression scale)	There were highly significant improvements in symptoms, QOL, mood and emotional bother in 'full-PCT' at 1 week, maintained over the 4-week follow-up. A smaller effect was seen in 'telephone-PCT'; there were no significant differences between the groups. There was very little difference in the length of hospital stay or rates of readmission between the two groups.
Porock et al. [13]	9, Advanced cancer	Pilot study	Physio-therapist	Intervention group: Educated on the importance and benefits of exercise, motivational tools, and regular monitoring of pulse levels, and would then be prescribed an individualized plan. Two weeks. Control group: None.	Fatigue (Multidimensional Fatigue Inventory), Symptoms (Symptom Distress Scale), Anxiety and Depression (Hospital Anxiety and Depression scale), Quality of life (QOL Scale)	There is a slight decrease in fatigue scores (improvement). There may have been a trend towards decreasing anxiety levels. QOL scores improved.

Table1: Characteristics of studies on rehabilitation for cancer patients in palliative care.

Methods

A systematic review was carried out by a team composed of one physician, one epidemiologist, one nurse and four occupational therapists, to clarify the efficacy of medical rehabilitation during palliative care in cancer patients.

A literature search of the medical literature database Pub Med was conducted on August 17, 2009, using the key words "cancer," "palliative care," and "rehabilitation." The search was confined to interventional studies, and review papers, case reports and papers whose main text was in a language other than English despite being appended with an English abstract were excluded. Only studies focusing on the physical functioning and activities of daily living were sought. The papers collected thus were reviewed systematically as to the following features, with discussions held twice a year among the study members (4 sessions in total): country of the lead author, year of publication, number

of subjects, location of the cancer, age, study design, occupational composition of the rehabilitation team, intervention (method, content, frequency and period), and the primary outcome.

Data extraction for all the studies was performed in duplicate by two independent reviewers, and the accuracy of the extracted information was confirmed by an additional review. After a full text review, if any discrepancies existed between the findings of the 2 reviewers, a third reviewer determined the eligibility of the article and the reviewers were asked to reach a consensus. In addition, the third reviewer also verified that the articles deemed ineligible did not meet the eligibility criteria.

Results

Of the 604 papers written in English collected using the initial key words, only 8 [6-13] satisfied the criteria mentioned above and were adopted for this study. A summary is shown in Table 1.

Country of the lead author, and year of publication

The country of the lead author among the 8 studies that comprised the subject of this review was the USA for 3 papers, UK for 2, Australia for 2, and China (Hong Kong) for 1. Thus, many of the papers were written by authors whose native language was English. One article each, except for the two papers published in the *J Palliat Med*, was published in 7 journals. The year of publication was 2008 for 2 papers, 2007 for 2, 2005 for 2, 2002 for 1, and 2000 for 1 paper. Thus, all of the 8 papers had been published within the last 10 years.

Number of subjects, and cancer type

Except for one study which covered only a small number of study subjects (9 cases) the remaining 7 studies covered a considerably large number of patients (24, 36, 42, 82, 109, 261 and 327 cases, respectively), with a mean of 111 cases (SD: 119 cases). The cancer type was unspecified in many patients (5 papers). Among the studies with specified cancer types, breast cancer was predominant (3 papers).

Study design

Only 3 studies were randomized controlled trials (RCTs). Among the others 1 was a retrospective study, 1 was a feasibility-type study, 1 was a controlled study, 1 was a prospective uncontrolled study, and 1 was an experimental study.

Occupational composition of the rehabilitation team

In the analysis of the composition of the rehabilitation team, one paper did not provide information about the occupations of the rehabilitation team members. Among the remaining 7 studies, the rehabilitation team was composed of members of a single occupational category (nurses in 2 studies, occupational therapists in 1 study, and physical therapists in 1 study). The rehabilitation team in the 2 remaining studies was composed of members of multiple occupational categories.

Intervention (method, content, frequency and period)

The intervention involved group care in all the studies, and separate care of individual patients in none. The contents of the interventions were diverse, including relaxation, interviews, writing sentences, combination of occupational therapy/nursing/physical therapy, psycho-educational activity, conversations over telephone, positioning, use of self-assist devices, physical exercise, etc. The frequency of the intervention was not daily in many of the cases. The intervention period was often in units of weeks.

Primary outcome

A variety of primary outcome measures were analyzed, including pain, functional status, symptoms, malaise, sleep status, eating behavior, degree of satisfaction, psychological health, emotional status, QOL, health-related QOL, anxiety, depression, and so on. Many studies evaluated physical and mental problems. Analysis of the motor organs or motor dysfunction was seldom incorporated into the studies.

Discussion

The present study was a systematic review of the published papers identified with the key words of “cancer,” “palliative care,” and “rehabilitation.” The WHO definition of palliative care in 1989 suggested that palliative care is positioned at the end of treatment. The definition was modified in 2002, clearly stating that palliative care represents intervention that should begin with the diagnosis of cancer, regardless of the stage at diagnosis. Although palliative care is not

confined to patients with cancer, the scope of the literature search in the present study was confined to papers dealing with palliative care of cancer patients. The term “rehabilitation” has a long history and covers a wide area. Therefore, we need to define this term as used in this study. The present study was aimed at investigating rehabilitation approaches applied to cancer patients from the standpoint of supporting the daily living of cancer patients, i.e., as a means of intervention based on medical knowledge and skill. Therefore, rehabilitation in this study corresponded to “medical rehabilitation” as defined in the conventional classification of fields. However, it was not “rehabilitation medicine.” This is because the rehabilitation covered by our investigation encompassed all types of cancer and was not confined to cancer of the motor organs or cancer-related disorders of motor function.

Many of the papers reviewed were published from regions where English is the native language. Thus, studies on this topic were published only from a limited number of districts in Japan. The papers were published, one each, in 7 journals, with some duplication in particular journals, suggesting that publication of this kind of paper was not biased to some particular journals. All of the papers reviewed were published within the last 10 years. This indicates that the history of interventional studies on rehabilitation associated with palliative care for cancer is short. Our literature search excluded individual or multiple case reports. While one of the 8 studies covered a small number of subjects (9 cases), the remaining covered a mean of 111 cases, suggesting that the results of our review of rehabilitation intervention should be valid, at least to some degree.

The percentage of studies clearly specifying the cancer type was low (62.5%). Among the studies specifying the cancer type, breast cancer was predominant (37.5%). Based on these results, combined with the tendency for a lack of definite information about the cancer stage in the papers, we may say that reports based on oncology were rare.

In regard to the study design, only 3 of the studies were RCTs (study design with a high evidence level), illustrating the scarcity of evidence-based studies. Analysis of the composition of the rehabilitation teams revealed the characteristics of the healthcare professionals involved in rehabilitation. Among the 8 studies reviewed, the rehabilitation team in 5 was composed of a single occupational category (nurses in 2 studies, occupational therapists in 2 studies, and physical therapists in 1 study), and in only 2 was the rehabilitation team composed of members from multiple occupational categories. This indicates that as far as rehabilitation of cancer patients receiving palliative care is concerned, few interventional studies have been carried out involving treatment teams composed of members from multiple occupational categories.

The intervention involved group care in all the studies. Indeed, group care is sometimes adopted to utilize the group dynamics for treatment. However, medical rehabilitation for patients with cancer and other diseases adopts individual (1:1) intervention, as a rule. In practice, individual intervention is primarily used in the care of physically handicapped individuals. Therefore, it would be desirable, in the future, to conduct interventional studies with individual interventions (1:1). Analysis of the contents of the intervention revealed utilization of various means such as relaxation, interviews, psycho-educational intervention, etc. On the other hand, the conventionally used means in rehabilitation medicine (e.g., functional recovery training, physical function recovery through functional compensation, and physical exercise) were rarely used. Considering that relaxation techniques (physical relaxation) or linguistic activities (interviews, psycho-educational intervention, etc.) were predominantly used in the studies reviewed, we may say that current rehabilitation interventions

in palliative care for cancer lay greater emphasis on the mental aspects than the physical aspects. In regard to the primary outcome, the study revealed that many of the studies covered both physical and mental problems through evaluation of diverse indicators of the primary outcome. Analysis of the motor organs or motor dysfunction, which is adopted in conventional rehabilitation medicine, was seldom incorporated in the studies reviewed. These results suggest that rehabilitation interventions in palliative care for cancer require new indicators differing from those adopted in conventional rehabilitation medicine.

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References

1. Clark RL, Moreton RD, Healey JE, Macdonald EJ (1967) Rehabilitation of the cancer patient. *Cancer* 20: 839-845.
2. McAleer CA, Kluge CA (1978) Why cancer rehabilitation? *Rehabil Counseling Bull* 21: 208-215.
3. Greenlee RT, Murray T, Bolden S, Wingo PA (2000) Cancer Statistics, 2000. *CA Cancer J Clin* 50: 7-33.
4. Shigemoto K, Abe K, Kaneko F, Okamura H (2007) Assessment of degree of satisfaction of cancer patients and their families with rehabilitation and factors associated with it--results of a Japanese population. *Disabil Rehabil* 29: 437-444.
5. Hamaguchi T, Okamura H, Nakaya N, Abe K, Abe Y, et al. (2008) Survey of the current status of cancer rehabilitation in Japan. *Disabil Rehabil* 30: 559-564.
6. Bruera E, Willey J, Cohen M, Palmer JL (2008) Expressive writing in patients receiving palliative care: a feasibility study. *J Palliat Med* 11: 15-19.
7. Miller J, Hopkinson C (2008) A retrospective audit exploring the use of relaxation as an intervention in oncology and palliative care. *Eur J Cancer Care (Engl)* 17: 488-491.
8. Steinhäuser KE, Alexander SC, Byock IR, George LK, Olsen MK, et al. (2008) Do preparation and life completion discussions improve functioning and quality of life in seriously ill patients? Pilot randomized control trial. *J Palliat Med* 11: 1234-1240.
9. Ruff RL, Ruff SS, Wang X (2007) Persistent benefits of rehabilitation on pain and life quality for nonambulatory patients with spinal epidural metastasis. *J Rehabil Res Dev* 44: 271-278.
10. Lee WT, Chan HF, Wong E (2005) Improvement of feeding independence in end-stage cancer patients under palliative care--a prospective, uncontrolled study. *Support Care Cancer* 13: 1051-1056.
11. Yates P, Aranda S, Hargraves M, Mirolo B, Clavarino A, et al. (2005) Randomized controlled trial of an educational intervention for managing fatigue in women receiving adjuvant chemotherapy for early-stage breast cancer. *J Clin Oncol* 23: 6027-6036.
12. Hanks GW, Robbins M, Sharp D, Forbes K, Done K, et al. (2002) The impact study: a randomized controlled trial to evaluate a hospital palliative care team. *Br J Cancer* 87: 733-739.
13. Porock D, Kristjanson LJ, Tinnelly K, Duke T, Blight J (2000) An exercise intervention for advanced cancer patients experiencing fatigue: a pilot study. *J Palliat Care* 16: 30-36.