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Physiotherapy in the context of palliative care in oncology: a pooled analysis

Fisioterapia no contexto dos cuidados paliativos em oncologia: uma análise conjunta

Claudia Melo Canto[1]*, Yandra Alves Prestes[1], Maria Gabriela de Andrade Lucena[2], Hércules Lázaro Morais Campos[1]

ABSTRACT

Objective: To document the role of physiotherapy in the context of palliative care in cancer through an integrative literature review, as the prevalence and survival of cancer are increasing and physiotherapy can significantly contribute to the treatment of these patients. **Methods:** A search was made in the literature for scientific articles that substantiated the physiotherapist's role in palliative care in oncology, and an assessment of the methodological quality of the selected clinical trials. **Results:** Studies demonstrate positive results, as they propose effective protocols that mostly include exercises in different modalities associated or not with other resources such as PNF, TENS, manual therapy, ultrasound, thermotherapy, acupuncture, and oxygen therapy, which help in reducing symptoms such as cancer fatigue, pain, and dyspnea, improving the patient's quality of life. The average score for clinical trials was reasonably low. **Conclusion:** The results reaffirm the importance of physiotherapeutic interventions in cancer patients receiving palliative care.

Keywords: Cancer; Physiotherapy; Palliative care; Physiotherapy modalities.

RESUMO

Objetivo: Documentar o papel da fisioterapia no contexto dos cuidados paliativos em câncer por meio de uma revisão integrativa da literatura, visto que a prevalência e a sobrevida do câncer estão aumentando e a fisioterapia pode contribuir significativamente para o tratamento desses pacientes. **Métodos:** Foi feita uma busca na literatura de artigos científicos que comprovassem a atuação do fisioterapeuta nos cuidados paliativos em oncologia e uma avaliação da qualidade metodológica dos ensaios clínicos selecionados. **Resultados:** Os estudos demonstram resultados positivos, pois propõem protocolos eficazes que, em sua maioria, incluem exercícios em diferentes modalidades associados ou não a outros recursos como FNP, TENS, terapia manual, ultrassom, termoterapia, acupuntura e oxigenoterapia, que auxiliam na redução de sintomas como como câncer, fadiga, dor e dispneia, melhorando a qualidade de vida do paciente. A pontuação média dos ensaios clínicos foi razoavelmente baixa. **Conclusão:** Os resultados reafirmam a importância das intervenções fisioterapêuticas em pacientes com câncer em cuidados paliativos.

Descritores: Câncer; Fisioterapia; Cuidado paliativo; Modalidades de fisioterapia.

1. Universidade Federal do Amazonas, Instituto de Saúde e Biotecnologia, Fisioterapia, Coari - AM, Brazil.
2. Hospital Paulistano, Fisioterapia - São Paulo - SP, Brazil.
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Correspondence author: Claudia Melo Canto, Universidade Federal do Amazonas, Instituto de Saúde e Biotecnologia, Fisioterapia, Coari - AM, Brazil.
E-mail: claudiamel98@hotmail.com

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INTRODUCTION

The prevalence of cancer and cancer survival are increasing. Palliative care develops care for these patients, being applicable both at the beginning of the disease course with therapeutic possibilities of cure and in its absence.[1,2] Set of interventions carried out by a multidisciplinary team, consisting of nurses, psychologists, doctors, social workers, pharmacists, nutritionists, physiotherapists, speech therapists, occupational therapists, dentists, and spiritual assistants, control or improve the physical, psychological and spiritual signs and symptoms of the patient and of your family[3,4] through early identification, correct assessment and treatment according to your specific needs.[1,3,5] Palliative care can also be considered an alternative to active and/or conventional care, that is, systemic treatment, which includes chemotherapy, hormone therapy, target therapies, immunotherapy, and others, common in several units of the Federation.[5,6]

Cancer, in general, is considered the main public health problem in the world and is classified as one of the 4 main causes of death before 70 years of age.[7] According to GLOBOCAN estimates, in 2020, there were 19.3 million new cases of cancer in the world and 9.96 million deaths due to this disease.[8] According to GLOBOCAN estimates, in 2018, there were 18.1 million new cases of cancer in the world and 9.6 million deaths due to this disease.[8] It is estimated that in Brazil, every three-year period between 2020 and 2022, 625 thousand new cases of cancer will occur.[7]

The principles of palliative care include: reaffirming the importance of life, when justifying death as a natural process; establishing care that does not accelerate the arrival of death, nor prolong it with unnecessary measures; providing relief from pain and other painful symptoms; integrating psychological and spiritual aspects in the care strategy, offering support to the family so that they can face the patient's illness and survive the period of mourning.[9]

Although it is ensured to patients with different chronic conditions, palliative care ends up being more described in the literature for cancer patients[1,10] due to its chronicity content and possible absence of cure, because even in the face of technological advances associated with therapeutic evolution, the index of mortality for this pathology is still high.[5]

Physiotherapy acts in a complementary and essential way in the palliative approach, the physiotherapist, as a member of the multiprofessional team, seeks to provide the necessary care to cancer patients, both in improving symptoms and quality of life.[11,12] The rehabilitation is important at all phases of cancer treatment, since diagnosis until its to the terminal stage.[13] From the moment of the diagnosis of cancer, the patient is subject to the most diverse changes, be they pain, osteomioarticular, respiratory, circulatory, psychophysical symptoms, among others.[11,12,14-16] which interfere with functionality and independence.[15] The physiotherapist acts in both prevention and health promotion of cancer patients in palliative care.[12]

Scientific articles were sought in the literature to support the role of the physiotherapist in palliative care in oncology, producing a picture of the oncology physiotherapist's actions.

METHODS

An integrative literature review based on evidence-based practice (PBE) was carried out with in-depth knowledge about a topic, with the aim of gathering and synthesizing results, showing the gaps to be filled in the conduct of new studies, in addition to the evaluation of methodological quality of included clinical trials.[17,18]

Research tactics

Simultaneous searches were carried out by two reviewers between July and October 2020, on the platforms PEDro (Physiotherapy Evidence Database), PubMed (Public Medical Literature Analysis Online), SciELO (Scientific Electronic Library Online) and LILACS (Latin American and Caribbean Literature in Health Sciences). The combinations of terms used were: "physiotherapy and palliative care and cancer", "palliative care physiotherapy", "cancer and physiotherapy and palliative care", "electrotherapy and palliative care and cancer" and "non-pharmacological therapy, cancer, palliative care " in English; *"fisioterapia, cuidado paliativo, câncer", "cuidado paliativo e fisioterapia"* in Portuguese; and *"fisioterapia, cuidados paliativos, cáncer"* e *"fisioterapia y cuidados paliativos"* in Spanish.

Inclusion criteria

Studies were selected that addressed the physiotherapist's performance in the context of palliative care for cancer patients that were published between January 2010 and July 2020, available in full and online, whether written in English, Portuguese or Spanish. Excluding studies published prior to 2010 that did not include physiotherapy in the process of treating palliative care for cancer patients.

Methodological quality assessment of studies

The clinical trials selected to compose the data collection in this search were submitted an evaluation using the PEDro quality scale, developed by the Physiotherapy Evidence Database, which establishes a total score of up to 10 points, with 11 evaluation criteria, which are available at PEDro database (www.pedro.org.au).[19]

Data extraction

There was a process of analysis of the articles in order to extract data related to the most varied segments

of physiotherapy, its effectiveness, and application in the palliative treatment process of cancer patients.

RESULTS

Studies were found that demonstrate the possible actions of the professional physiotherapist within the context of palliative care, with direct action for the oncological fatigue, pain, depression, and quality of life. The average score of the clinical trials selected assessed using the PEDro quality scale equal to 5.4, as shown in Table 1.

Multimodal exercises were the most recommended for reducing fatigue and increasing quality of life, and the other findings are described in the Table 2.

Table 1. Methodological quality assessment. Study score according to the PEDro scale.

Author/year	Score
Oldervoll et al. (2011)[20]	5/10
Farquhar et al. (2014)[21]	6/10
Pyszora et al. (2017)[22]	6/10
Henke et al. (2014)[23]	3/10
Poort et al. (2020)[24]	7/10

DISCUSSION

Palliative care interventions for cancer patients include physiotherapy modalities that seek to heal or to decrease signs and symptoms commonly reported by these patients, such as pain, fatigue, dyspnea, and reduced physical function, which interfere in the performance of activities of daily living and consequently in their quality of life.[20,22,25,27] Researches carried out on exercise and rehabilitation in palliative care demonstrate benefits on these disorders and treatment adherence.[30] The studies selected for this research mostly include different exercise modalities,[20-28] besides, transcutaneous electrical nerve stimulation (TENS),[25,28,29] thermotherapy,[25,27] cognitive therapies,[24,28] mobilization,[25,27,28] massage therapy,[22,28] positioning,[21,27] proprioceptive neuromuscular facilitation (PNF),[22] ultrasound drainage,[25] breathing techniques, and oxygen therapy,[21,23] as interventions that provide some significant result for patients with cancer.

For the outcome of pain, protocols were found with the use of transcutaneous electrical nerve stimulation (TENS), and one of the studies,[29] used a protocol with high intensity modulated application, that is, with a frequency of 100Hz applied at the pain site, which was reported by the patient and then the patient chose the strongest but comfortable intensity, this intensity decreased by 40% every 0.5 seconds in order to avoid his habituation with the application over time[29] and the other[28] using low frequency TENS also in the painful area but being a complementary part of an intervention based on cognitive-affective mechanisms, central sensitization, peripheral sensitization, pain sympathetically maintained, and nociceptive. These mechanisms included, besides TENS, self-monitoring of pain, sciatic nerve compression technique, peripheral nerve massage, peripheral nerve sliding techniques, sympathetic slump technique performed for the thoracic region with the patient in a long-term sitting position, mobilization of the thoracic spine if restricted mobility was found, soft tissue massage, passive, active-assisted, free-active and resisted exercises.[28]

The protocols that aimed to reduce fatigue highlighted the performance of exercises. One of them compared the practice of graduated exercises of aerobic and resistance training according to the physical fitness of patients with cognitive behavioral therapy,[24] while in another, the effects of a physical therapy program that included active upper and lower limb exercises were verified, myofascial release techniques and proprioceptive neuromuscular facilitation (PNF), where in addition to obtaining significant results related to fatigue, it was also able to improve other associated symptoms such as anxiety and depression, improving muscle performance and general fitness of patients.[22]

In the presence of dyspnea, it is suggested that a series of intervention measures be carried out. In view of this, a service model for breathlessness intervention called breathlessness intervention service (BIS) was compared to usual care for breathlessness. This service model is a complex multidisciplinary intervention that combines pharmacological and non-pharmacological therapies, which include the use of a hand ventilator, breath control, stimulation and exercise activity, psychological support, emergency plan, positioning, lifestyle adjustment, individualized exercise plan, debugging techniques, nutrition and hydration advice, brief cognitive therapy, in addition to more advanced stages include acupuncture, short- or long-term oxygen therapy.[21]

The recommendations of a referral unit in relation to the physiotherapeutic care of patients in oncology palliative care in time of pandemic by COVID-19, highlight the non-use of non-invasive ventilation, even though this is an option of choice for the management of cancer patients who report dyspnoea, in order to avoid contamination, but to carry out strategies for comfort and management of this symptom, with maintenance, cooling of the patient's face, postural adjustment, and relaxation techniques. They also report important interventions to avoid fatigue, such as adapting the environment, early mobilization and functional incentive, either through teleconsultation or booklets.[27]

In order to maintain or recover physical performance and functionality, a protocol[26] evaluated the effectiveness of an intervention based on the "OTAGO exercise program" that combines strength and balance exercises, which has been shown to be viable, safe and beneficial in elderly and fragile patients, this consists of performing exercises 3 times a week, for 20-25 minutes in addition to repetitions

Table 2. Summary of evidence. Physiotherapeutic actuation in the context of palliative care.

Author/ year	Sample	Physiotherapeutic acting	Duration and frequency of intervention	Questionnaire / scale of evaluation	Results
Oldervoll et al. (2011)[20]	N=231 patients with incurable and metastatic cancer. Physical exercise group (PGE): 121 Usual care group (UCG): 110	Groups exercises of from 2 to 8 patients supervised by a physiotherapist. Warm up activity 10-15min with aerobic exercises. Circuit training with 6 stations 30min. stretching/relaxation 10-15min. All with individual adaptation.	2 weekly sessions of exercise for 50-60min, for 8 weeks.	Karnofsky desempenho status (KPS). Fatigue questionnaire (FQ). Shuttle walk test (SWT).	78 patients (PEG) and 85 patients (UCG) completed the study. A statistically significant improvement in physical performance was found for the group PEG compared to group UCG after 8 weeks.
Farquhar et al. (2014)[21]	N=67 patients with advanced cancer. The fast-track group (intervention): 35 Control group: 32	Breathlessness intervention service (BIS): explanation and security; hand-held fan; breath control; exercises with individualized plan; positioning to reduce respiratory work; brief cognitive therapy; acupuncture, [LTOT, long-term oxygen therapy and short-term SBOT].	5 weeks.	Numerical rating scale (NRS). Chronic respiratory questionnaire (CRQ). Depression scale (HADS).	54 completed the test. 68% reported that the BIS had a significant impact, 28% indicated that it had an impact and 4% did not report an impact. Including reductions in fear, anxiety, worry, feeling of panic, and increased confidence about shortness of breath.
Pyszora et al. (2017)[22]	N=60 patients diagnosed with advanced cancer. Therapy group: 29 Control group: 29	Active upper and lower limb exercises, myofascial release techniques, and proprioceptive neuromuscular facilitation (PNF) techniques. Sessions conducted by the same physiotherapist.	2 weeks, with 6 therapy sessions of 30 minutes, three per week.	Numerical rating scale (NRS). Edmonton symptom assessment scale (ESAS). Brief fatigue inventory (BFI).	The proposed program significantly reduces the severity of fatigue in cancer patients receiving palliative care. In addition to improving the general well-being of patients and reducing the severity of their symptoms, especially pain, drowsiness, loss of appetite, and depression.
Henke et al. (2014)[23]	N=46 patients with stage IIIa, IIIb, and IV lung cancer. Intervention group (IG): 18 Control group (GC): 11	Functional resistance training with walking exercise in the corridor and up and down stairs, with moderate intensity, calculated using the Karvonen formula. 4 combined strength and endurance exercises for trunk, leg, arm, and abdominal musculature with an emphasis on repetitions. Physical therapy breathing techniques that included the active cycle of breathing (ACBT). Conventional physiotherapy for patients of both groups in cases of severe dyspnoea.	From the first day of chemotherapy to the third cycle of chemotherapy. Resistance training and breathing techniques: 5 days a week. Strength training: alternate days of the week.	Barthel index. Life questionnaire Core-30 (EORTC QLQ-C30/LC13). The 6-minute walk test (6MWT). Modified Borg scale (MBS).	Significant differences were found between the groups on the 6MWT, the exercise of climbing up and down stairs and strength capacity (IG> CG). In addition, the level of dyspnea decreased significantly in GI during submaximal performance walking activities.
Poort et al. (2020)[24]	N=134 severely fatigued cancer patients. Cognitive behavioral therapy (CBT): 46 Graduated exercise therapy (GET): 42 Usual care: 46	CBT: several modules that deal with different cognition levels and behaviors that perpetuate fatigue. GET: supervised exercise program at the hospital or local physiotherapy clinic with individually graded aerobic and resistance training. Usual care. Treatment for the advanced cancer according to the national guidelines of the Netherlands.	14 weeks CBT: 10 1-hour sessions over 12 weeks. GET: weekly 2 hours sessions for 12 weeks.	Checklist individual strength, fatigue severity subscale (CISfatigue). Quality of life questionnaire-core 30 (EORTC-QLQ-C30). Sickness impact profile (SIP8).	Among patients with advanced cancer receiving treatment with palliative intent, CBT reduced fatigue, improved QOL and physical functioning, with effects sustained for 3 months after the intervention. Additional adaptations are needed to improve the viability of a GET intervention for this seriously ill population.
Lee et al. (2018)[25]	N=45 terminal cancer patients Men: 19 Women: 26	Taking into consideration the problem of each patient, it was recommended: Physical therapy in the gym with exercise bike, parallel bar gait and others; Bedside physiotherapy, with active and passive amplitude or movement exercises; Physical modalities, with thermotherapy, ultrasound, TENS or interferential current, intermittent pneumatic compression and manual lymphatic drainage;	6 weeks.	Eastern cooperative scale (ECOG). Karnofsky performance scale. Functional ambulation category (FAC).	Patients with adherence to physiotherapy at the gym had higher survival. Comprehensive rehabilitation approaches help with the various problems faced by cancer patients in palliative care units.

Continue...

Continuation...

Blum et al. (2020)[26]	N=6 patients in palliative care.	Assessment of physical function and overall quality of life and psychosocial suffering. Intervention based on the "OTAGO exercise program" that combines strength and balance exercises and encouragement to continue the program at home.	3 times a week, lasting 20-25 minutes.	Tinetti-test (TT). EORTC-QLQ-C30. Distress thermometer (DT).	Four patients completed the intervention and two reported continuing the program at home. Those able to complete the intervention, there was a reduction in distress and an increase in quality of life.
Mendes et al. (2020)[27]]	Recommendations of one referral unit for the physiotherapeutic care to patients in oncology palliative care in times of pandemic by COVID-19.	Dyspnea: (NIV) is not indicated. If instituted, it must be carried out with strict use of PPE, appropriate equipment and interfaces. Maintenance of a quiet and ventilated environment, with open windows, cooling of the patient's face with cold compresses, use of comfortable clothing, postural adjustment preferably with an elevated headboard and relaxation techniques are recommended. Intense fatigue: proposing management of home activities with energy conservation techniques, asking for help from family members and caregivers, scheduling activities with different levels of requirements, starting from the lowest energy expenditure level, to the highest according to the patient's tolerance. In the hospital environment: early mobilization must be encouraged and the functional incentive besides activities within the room. Hospital discharge patients: monitoring through teleconsultation or telemonitoring for symptom control and functionality. Home care: booklets with guidance on exercises, use of orthoses and other physical therapy resources, which can be delivered to the family by one.	--	--	The cancer patient under palliative care is in a process of physical loss, emotional and spiritual, which have a direct impact on their quality of life, the continuity of their treatment cannot be neglected, dignity will be guaranteed.
Kumar et al. (2013)[28]	N=24 cancer patients. Men: 6 Women: 18	Mechanism-based physiotherapy. Cognitive-affective: education in pain, stimulation, training with graduated activities, and cognitive-behavioral therapy. Central sensitization: TENS of low frequency in the painful area. Peripheral sensitization: sciatic nerve compression technique, peripheral nerve massage, and peripheral nerve sliding techniques. Pain sympathetically maintained: long-lasting slump technique. Mobilization of the thoracic spine in the face of restricted mobility. Nociceptive: high frequency TENS, mobilization, soft tissue massage, passive, active-assisted, free-active and resisted exercises.	Once a week for a period of 5 weeks, with each session of the 30min.	Brief pain inventory (BPI). EORTC-QLQ C30.	Mechanism-based physiotherapy produced a clinically and statistically significant change in BPI and EORTC-QLQ-C30 scores among people with cancer pain.
Siemens et al. (2020)[29]	N=20 patients with cancer and pain. Placebo intervention (IMT-PBT): 11 Placebo intervention (PBT-IMT): 9	Dual channel TENS device (ARTROSTIM® SELECT™, ORMED) was used at the pain site in the intervention phase (IMT) and placebo TENS (PBT). IMT: TENS intensity modulated (IMT) with 100Hz.	48 hours with application according to the patient's wishes.	Numerical rating scale (NRS).	As secondary outcomes, we found higher response rates for IMT than for PBT and average changes in both groups that may be clinically relevant for patients, especially in the IMT group.

of the protocol at home, with a reduction in distress and an increase in quality of life.[26]

Another intervention refers to a group exercise program, which was composed of 3 stages. The first stage consisted of 15 minutes of warm up with aerobic exercises, the second in 30 minutes of circuit training with strength exercises for lower and upper limbs, balance, general functioning, and aerobic resistance, subdivided into 6 stations, which had as indicator music and the third in 5 minutes of stretching and relaxing the muscles with calm music in the background, which clinically and statistically improved the physical performance of patients.[20]

The findings of studies to maintain or gain quality of daily life and capacity to perform activities of daily living suggest protocols that include exercise combined or not with other segments of physiotherapy. Strength and endurance training was compared with conventional physical therapy care and proved to be effective. This training includes resistance exercises to walk up and down stairs in moderate intensity according to capacity of the patient calculated by the Karvonen formula, combined with breathing techniques with active breathing cycle (ACBT), in order to reduce the obstruction of the airways and improve the release of secretions performed 5 days a week, in addition to 4 strength and endurance exercises combining trunk, leg, and abdominal muscles, using an elastic band (Thera-band) as resistance for this muscular segment, emphasizing no to increased load, but to the number of repetitions.[23]

Already another intervention offered, according to the individual problems of each patient, a different intervention, being, physiotherapy in the gym performing gait training exercises, on the exercise bike and others, physiotherapy at the bedside, with active and passive exercises, of amplitude or movement , physical modality, with thermotherapy, ultrasound, TENS, interferential current, intermittent pneumatic compression and manual lymphatic drainage, change in medication, which was performed by a doctor, interventions for pain with the application of drugs administered intravenously. The patients allocated to the physiotherapy group at the gym, had a longer survival and the intervention in general was beneficial.[25]

The results of this study are in agreement with previous studies which demonstrate that physical therapy in palliative care can promote quality of life and well-being respiratory and/or motor of patients living with cancer.[31,32]

CONCLUSION

Within the context of palliative oncology care, the results found show that physiotherapy through interventions of strength and resistance exercise, electrotherapy, cognitive therapies, therapeutic massage, early mobilization, breathing and positioning techniques, and others, has a significant effect on symptoms such as: pain, fatigue, dyspnea, relative loss of functionality, and the ability to independently perform activities of daily living, results that reaffirm the importance of physiotherapeutic interventions in cancer patients receiving palliative care. However, the number of published clinical trials with a high level of evidence on the multiple segments of physiotherapy in the treatment of cancer patients under palliative care is still very scarce.

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