

**Introduction:** Pain related to cancer, despite the numerous treatment options available, is still a challenge in contemporary pain medicine. The unsatisfactory treatment of cancer pain is one of the main reasons why patients seek complementary and alternative methods (CAM) and a more integrative/holistic approach to pain management. The popularity of CAM forces healthcare professionals to provide patients with current and evidence-based information on the effectiveness and safety of CAM. The aim of the paper is to present current evidence and limitations regarding CAM commonly used in the pain management of cancer patients.

**Material and methods:** The paper comprehensively reviews the current and most relevant literature considering the integrative approach to management of pain due to cancer disease and/or cancer treatment.

**Results:** The available data from clinical trials, meta-analyses, and systematic reviews supports the effectiveness of acupuncture, massage, physical exercises, music therapy, and mind-body therapies as adjunct therapies for alleviating pain in cancer patients, although the supporting evidence is weak or moderate.

**Conclusions:** Based on the available knowledge, physicians should be capable of advising the cancer patient as to which CAM methods can be used safely, which are contraindicated, and what therapeutic effects they may expect, especially when standard pain treatment fails or induces serious side effects. An integrative approach to cancer pain management may improve the quality of pain treatment, patients' quality of life, and satisfaction with pain relief.

**Key words:** cancer pain, acupuncture, complementary and alternative methods, physical activity, pain management.

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# The role of complementary and alternative methods in the treatment of pain in patients with cancer – current evidence and clinical practice: a narrative review

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## Introduction

Despite the availability of a variety of pain treatment methods, the efficacy of analgesic therapy in cancer patients is still unsatisfactory. Epidemiological studies performed in the 90s have reported that up to 50% of patients suffer from poorly controlled pain, which noticeably reduced their quality of life (QoL) and negatively affected the course of cancer treatment [1]. A recent meta-analysis published in 2016 showed that the situation has not been changed significantly – pain is experienced by 39.3% of patients after anti-cancer treatment, by 55% of patients during cancer treatment, and by 66.4% patients at the advanced, metastatic stage of cancer disease. The patients at advanced stage of cancer disease are more likely to experience moderate to severe pain (numerical rating scale – NRS  $\geq$  5) than are patients after curative anti-cancer treatment (51.9% vs. 27.6%) [2].

Pain in cancer patients is a complex entity with multifactorial aetiology. Pain may be caused by malignancy (tumours and metastases), cancer treatments (chemotherapy, radiotherapy, hormonotherapy, steroids, surgery), and comorbid diseases (postherpetic neuralgia, back pain). In more than 20% of cancer patients a neuropathic component can be identified, which is related mainly to the tumour itself and to the cancer treatment [3].

There are still several barriers to successful cancer pain management, including patients' reluctance to report pain and take opioids, analgesic-induced side effects, and poor availability of multimodal treatment modalities. The effectiveness of pain management and treatment outcomes are also influenced by the complexity of cancer pain in terms of underlying mechanisms, multiple causes, and psychosocial patient-related factors [4].

The unsatisfactory treatment of cancer pain is one of the main reasons why patients are increasingly searching for other methods and more integrative/holistic approaches to pain management. Therefore, the complementary and alternative medicine (CAM) and integrative approach are steadily gaining in popularity among cancer patients, and according to available scientific data such an approach may be a beneficial treatment option.

There is no uniform or generally accepted definition of CAM in the literature. The National Centre for Complementary and Integrative Health (NCCIH), part of the US Department of Health and Human Services, defines CAM as

a group of health care approaches that are not typically part of conventional medical care or that may have origins outside of usual Western practice. The term complementary medicine refers to selected practices of non-conventional medicine used in conjunction with or as a complement to conventional medicine, while the term alternative medicine describes non-conventional therapeutic methods used instead of conventional ones. The complementary approach has now become more popular among patients, and the health benefits of complementary management have been confirmed by research [5].

According to the NCCIH, CAM techniques can be generally divided into 2 groups [5]:

- natural products – nutrition, probiotics, vitamins, minerals, herbs,.
- mind-body therapies – acupuncture, massage, healing touch, meditation, biofeedback, physical exercise, relaxation, chiropractic, tai chi, yoga, and hypnotherapy.

Broadly conceived, integrative medicine includes Ayurvedic medicine and traditional Chinese medicine (TCM) [5, 6].

So far, few randomized clinical trials have been conducted on CAM therapies in cancer patients, although the number of trials has significantly increased in the last decade. Scientific evidence based on clinical trials has supported the efficacy of some selected CAM methods in the management of cancer symptoms and side effects of treatment, e.g. acupuncture in the treatment of chemotherapy-induced nausea and vomiting and in the treatment of pain caused by cancer [7–10]. However, for more commonly used CAM methods, e.g. natural products, there is no evidence based on research regarding their efficacy, safety, or possible interactions with conventional anti-cancer treatment. At present, there is no convincing evidence to support the claims that any CAM methods can effectively cure the cancer, prolong life, or prevent cancer, the only exception being the physical exercise, which may reduce the risk of some types of cancer [5].

Studies conducted among European patients with cancer have confirmed the popularity of CAM methods. A European Partnership for Action Against Cancer (EPAAC) survey of patients in oncology centres in Europe showed that acupuncture (55% of centres), homeopathy (40%), herbal medicines (38%), TCM (36%), and anthroposophical medicine (21%) were the methods most commonly used by patients with cancer [11].

Considering the popularity of CAM among patients with cancer regardless of its severity, it is advisable that the physicians, when taking the patients' history, should also obtain information on the use of CAM methods other than conventional medicine. The patient should also be warned against unproven therapies advertised in various media as curative 'alternatives' to conventional medicine [8]. Therefore, it is necessary to communicate well with the patient, and to provide evidence-based information to the patients and their caregivers on the possible benefits and risks of using CAM methods at any stage of cancer disease.

Although scientific evidence in terms of analgesic efficacy is not strong, some CAM methods as components of integrative pain medicine may benefit numerous pa-

tients with cancer or cancer survivors. For this reason, CAM methods as a part of multimodal management have been included in the recommendations formulated by the American Society of Clinical Oncology [9, 12, 13], the American College of Chest Physicians [8], and the National Comprehensive Cancer Network [14].

## **Complementary and alternative methods in cancer pain patients**

### **Acupuncture**

Acupuncture is one of the basic healing methods in TCM. Acupuncture is a neuromodulatory method, which involves application of needles, heat, or pressure at specific points (acupoints) over the human body. The effect of acupuncture depends on stimulation and involves the activation of the body's neuro-endocrine response mediated by peripheral and central mechanisms [15, 16]. So far, the exact analgesic mechanism of acupuncture in humans has not been unambiguously explained, although experimental studies have shown that the stimulation of certain points by acupuncture activates several centres in the central nervous system (CNS) (among others periaqueductal grey matter, locus coeruleus, nuclei raphe magnus, rostral ventromedial medulla), resulting in activation of pain inhibition mechanisms and subsequent release of endogenous antinociceptive neurotransmitters, including endorphins, noradrenaline, dopamine, adenosine, endocannabinoids, and others [15, 17–19]. Studies using functional magnetic resonance imaging in acupuncture patients have shown that manual and electrical stimulation of acupuncture needles affects brain activity and connectivity, including areas associated with the affective and sensory aspects of pain and pain control [20, 21]. It has been confirmed that acupuncture decreases the level of proinflammatory cytokines and chemokines, and increases the level of neurotrophic factors, which may contribute to the analgesic effect of acupuncture [22, 23].

Acupuncture is proven to be effective in treating patients with non-cancer pain – back pain or pain caused by knee osteoarthritis [24, 25]. In recent years, however, several systematic reviews have been conducted to evaluate the efficacy and safety of acupuncture in the treatment of pain in cancer patients [10, 26–29].

One of the first Cochrane reviews on acupuncture in cancer pain patients, conducted by Paley *et al.* [26] showed that there was insufficient evidence to assess effectiveness of acupuncture in cancer pain treatment in adults, but the main limitation of this review was the very low number (5 studies) and low quality of studies analysed.

In the latest systematic review and meta-analysis Chiu *et al.* [10] assessed 36 trials ( $n = 2213$  participants) on acupuncture in patients with cancer-related pain, among which 17 studies focused on malignancy-related pain, 11 on chemotherapy- or radiotherapy-induced pain, 5 on surgery-induced pain, and 3 on hormone therapy-induced pain. The analysis confirmed that acupuncture may be moderately effective in the treatment of pain caused by the tumour itself – the weighted mean effect size was  $-0.71$  (95% CI:  $-0.94$  to  $-0.48$ ) in favour of acupuncture.

A smaller positive therapeutic effect was observed in patients with pain induced by surgery – the weighted mean effect size was  $-0.40$  (95% CI:  $-0.69$  to  $-0.10$ ) in favour of acupuncture. The analysis showed that there was no beneficial effect of acupuncture in patients with pain induced by chemotherapy or radiotherapy, although heterogeneity among the assessed studies was observed. The findings did not provide sufficient evidence for acupuncture's efficacy in the treatment of pain caused by hormone therapy, although acupuncture had a larger, but not significant, effect on pain intensity than sham acupuncture [10].

A review of 20 studies ( $n = 892$ ) (mostly the same studies as analysed by Chiu *et al.* [10]) conducted by Hu *et al.* [28] showed that acupuncture in cancer patients improved the effectiveness of standard pain therapy in accordance with World Health Organization recommendations. Acupuncture in combination with standard pharmacotherapy reduced the onset time of pain relief and prolonged duration of analgesic effect in comparison to pharmacotherapy alone. Moreover, acupuncture significantly improved the QoL of cancer patients. Acupuncture-related side effects occurred only in 8% of patients, were characterized by low intensity, and included subcutaneous haemorrhages, petechiae, and fainting.

Patients treated with anticancer agents such as platinum, taxanes, vinca alkaloids, bortezomib, and thalidomide may develop chemotherapy-induced peripheral neuropathy (CIPN) with persistent severe symptoms including pain, dysesthesias, numbness, tingling, and autonomic neuropathy. In a substantial number of patients with CIPN standard anti-neuropathic pharmacotherapy is not effective, so the symptoms persist and negatively impact the QoL [29]. A recent review of high-quality trials (3 randomized controlled trials – RCTs,  $n = 203$ ) on acupuncture in patients with CIPN did not unequivocally support acupuncture as an effective pain treatment method [30]. The trials assessed patients with breast cancer and multiple myeloma suffering from CIPN, caused by taxanes, platinum derivatives, or vinca alkaloids. Two studies showed that acupuncture was effective in patients with CIPN in terms of analgesic efficacy and QoL, but one study showed ineffectiveness of acupuncture for CIPN pain and QoL [30].

However, the effectiveness of acupuncture has been demonstrated in clinical studies of lower quality. One of the latest observational study conducted by Zhi *et al.* [31] assessed 27 patients experiencing bortezomib-induced CIPN, treated with acupuncture sessions. The patients were assessed for self-reported signs and symptoms of neuropathy using the Functional Assessment of Cancer Therapy/Gynaecologic Oncology Group-Neurotoxicity (FACT/GOG-Ntx) and neuropathic pain scale. In both scales there were statistically significant reductions in individual neuropathic symptoms observed. The authors concluded that acupuncture can improve several symptoms associated with bortezomib-induced CIPN, particularly numbness and tingling in hands and feet, cold sensitivity, and an unpleasant feeling, but larger studies are needed to assess the impact of acupuncture on neuropathic pain.

The lack of evidence and inconsistent data on the effects of acupuncture in patients with pain induced by can-

cer treatment (chemotherapy, radiotherapy) may be explained partially by the complex underlying mechanisms (mainly neuropathic) in this specific pain syndromes [10]. It is widely known that the presence of a neuropathic component makes the pain syndromes much more resistant to pharmacotherapy [32].

In clinical practice acupuncture, due to its ease of use and beneficial safety profile, may be recommended to patients with CIPN, particularly those who do not benefit from standard pharmacotherapy [29].

Aromatase inhibitor-induced arthralgia (AIA) is one of the most common side effect of chronic hormone therapy with aromatase inhibitors (anastrozole, letrozol, exemestane) in women with breast cancer. AIA symptoms (i.e. joint pain and stiffness) may occur in about 50% of patients [33]. These complaints significantly worsen the patients' QoL, are difficult to treat, and contribute to treatment discontinuation and cancer recurrence [34]. So far, no recommendations for the treatment of AIA have been formulated; however, most clinical trials comprised acupuncture, aerobic exercises, standard pain pharmacotherapy, omega fatty acids, and vitamin D [27, 35, 36]. In RCTs, acupuncture significantly reduced joint pain compared to no treatment, but the available data are too inconclusive to recommend acupuncture as the standard treatment for this pain syndrome [27, 35, 36].

The systematic review conducted by Bae *et al.* [27] (4 RCTs,  $n = 193$ ) on acupuncture in patients with AIA did not unequivocally support acupuncture as an effective pain treatment method. Two RCTs failed to find a significant difference between real acupuncture and sham acupuncture, but the joint pain improved in both groups. Two RCTs showed significant improvement of arthralgia pain compared with the control group (waiting list group).

Chen *et al.* [37] assessed 5 RCTs ( $n = 181$ ) on acupuncture in patients suffering from AIA. The authors found significant worst pain reduction in the brief pain inventory and the Western Ontario and McMaster Universities Osteoarthritis Index pain score after 6–8 weeks of treatment with acupuncture. One of the studies reported 18 minor adverse events in 8 patients.

Experts suggest that acupuncture should be used in individuals with AIA in whom other standard therapies, such as analgesics and exercise, proved ineffective [9, 36].

According to available literature and data, acupuncture can be used to treat pain in cancer patients, especially pain caused by the tumour itself and surgery. Its efficacy cannot be excluded in other refractory pain syndromes, such as CIPN or AIA. In clinical practice as part of multimodal pain management, acupuncture can be beneficial in selected patients.

Acupuncture is suggested by the experts of the American College of Chest Physicians for the treatment of cancer-related pain and CIPN in lung cancer patients, especially when standard pain treatments are ineffective or not well-tolerated [8].

Acupuncture is also suggested by the American Society of Clinical Oncology in the treatment of chronic pain, not only in women during and after breast cancer treatment [9], but also in all cancer survivors [12, 38].

Acupuncture is generally safe when performed by properly trained practitioners. The most common side effects resulting from acupuncture needling is local pain (3.3% patients), bruising (3.2%), minor bleeding (1.4%), and orthostatic problems (0.5%) [39].

There are specific safety precautions for cancer patients [40]:

- patients may be prone to infections and bleeding, so acupuncture should be avoided in patients with low neutrophil count, low platelet count, and international normalized ratio > 4,
- the acupuncture needles should not be inserted at sites of primary tumours or metastases, medical devices, open wound and skin lesions, local infections, and recent radiotherapy.

The experts emphasize also that acupuncture in cancer patients should be provided by professionally trained and experienced practitioners [40].

### Transcutaneous electrical nerve stimulation

Transcutaneous electrical nerve stimulation (TENS) is one of the most commonly used neuromodulation techniques in the treatment of acute and chronic pain, and its analgesic efficacy is supported by research findings. However, the analgesic mechanism of TENS is yet to be fully explained. It is believed that TENS stimulates the thick, non-nociceptive, touch-conducting A $\beta$  fibres, which inhibits the transmission of a nociceptive stimulus mediated by thinner A $\delta$  and C pain fibres at the spinal cord level (gate control theory of pain). TENS activates inhibitory neurons and increases extracellular concentration of  $\gamma$ -aminobutyric acid at the spinal cord level and activates descending antinociceptive systems [41–43].

TENS is inexpensive, easy to deliver, can also be performed at home, and its side effects are uncommon (allergic skin reactions, skin burns, swellings, increased pain intensity). Contraindications to TENS include pregnancy, pacemaker, epilepsy, and mental illness [44].

There are few studies on the efficacy of TENS in pain management in cancer patients, studies usually involve small groups, and are inconsistent in methodological terms. For this reason, it is difficult to conduct meta-analyses or systematic reviews, which translates into the lack of specific clinical recommendations [12]. A review conducted by Hurlow *et al.* [45] (3 RCTs,  $n = 88$ ) found that insufficient clinical data precludes a full assessment of the utility of TENS in cancer patients. However, in a cohort retrospective study ( $n = 76$  patients) by Loh *et al.* [46] TENS marginally reduced pain and improved the QoL in about 70% of patients with various types of cancer; the effect being particularly prominent in those with bone metastases. Single case reports in the literature suggest that TENS may be a useful option for the treatment of pain in cancer patients, especially in cases refractory to standard management methods, which significantly impairs the patients' QoL [47, 48].

### Massage

Massage is defined as the manipulation of soft body tissues using manual techniques such as pressure and trac-

tion. The likely analgesic mechanism involved consists of the activation of tactile peripheral nerve endings, whereby the stimuli originating from these fibres inhibit the conduction of afferent pain stimuli in a manner like TENS [49].

As part of the multimodal approach, therapeutic massage is being used more in treatment programs to reduce pain and related symptoms in cancer patients. Apart from its therapeutic effect, massage meets the patients' need for touch and contact with another person, which has a positive effect on their QoL and reduces the level of anxiety and stress, which alleviates pain sensation [49].

Despite its popularity and sound theoretical assumptions, there is still controversy and inconsistent evidence on the efficacy of massage in the treatment of pain in cancer patients.

A meta-analysis by Boyd *et al.* [50] (9 RCTs,  $n = 537$ ) showed that there was little evidence for the effectiveness of massage in reducing pain, fatigue or anxiety in patients with different types of cancer at different stages of the disease. Three studies included in the meta-analysis ( $n = 167$ ) found that massage alleviated pain more effectively than no treatment, with a standardized mean difference (SMD) of  $-0.20$  (95% CI:  $-0.99$  to  $0.59$ ) in favour of massage, although the studies were quite heterogeneous and study results were inconsistent. In 6 studies ( $n = 370$ ), in which massage was compared to active comparator, therapeutic massage resulted in a SMD of  $-0.55$  (95% CI:  $1.23$ – $0.14$ ) for a reduction of pain intensity. Most of these studies consistently showed that massage therapy was more effective than the active comparator. In the studies under review, no adverse effects of therapeutic massage were observed, which attests to the safety of this method.

Similar results concerning the effectiveness of massage have been described in a meta-analysis by Lee *et al.* [51] (12 RCTs,  $n = 559$ ). Massage therapy significantly reduced cancer pain compared with no massage treatment or conventional care (standardized mean difference,  $-1.25$ ; 95% CI:  $-1.63$  to  $-0.87$ ). Massage was particularly effective in patients with cancer-induced pain (after surgery and/or chemotherapy). The authors emphasize that further well-designed, large studies with longer follow-up periods are needed to confirm the effectiveness of massage in cancer patients.

The Cochrane review conducted by Shin *et al.* [52] included 19 studies (21 reports) of very low-quality evidence ( $n = 1274$ ). The authors concluded that there was a lack of evidence on the clinical effectiveness of massage for symptom relief in people with cancer, because most studies were too small to be reliable and key outcomes were not reported.

Therapeutic massage is suggested by the American College of Chest Physicians as part of multimodal therapy in patients with lung cancer with inadequately controlled pain or anxiety. Experts also emphasize that the therapy should be performed by a qualified masseur. It must be noted that deep, forceful compressions are not recommended in the vicinity of neoplastic lesions and associated coagulopathies [8].

When deciding to apply massage, one should bear in mind the general contraindications to the therapy, the

need to apply appropriate pressure, ensure adequate duration of the procedure, and ascertain that it is performed by an appropriately skilled professional [50].

### Physical exercises

Exercises can be safely performed by cancer patients, both during and on completion of active treatment.

The analgesic mechanism of exercises is not yet fully understood, but the beneficial effect of exercises may be associated with centrally mediated enhanced conditioned pain modulation, normalization of the neuroimmune signalling in the CNS, and subsequent reduction of hyperalgesia, as well as body mass reduction and improved functioning and mood [53].

Cochrane review conducted by Mishra *et al.* [54] (56 trials,  $n = 4826$  participants) showed that exercise improves pain scores in health-related quality of life (HRQoL), physical and social functioning, and reduces anxiety, sleep disturbances, and fatigue in cancer patients.

Single studies have also demonstrated the efficacy and safety of physical activity in patients treated for cancer. In a study by Courneya *et al.* [55], a total of 301 patients with breast cancer undergoing chemotherapy performed aerobic exercises for 25–60 minutes 3 times a week. A moderate but significant reduction in pain intensity was observed. Physical activity did not adversely affect the course of primary treatment or the number chemotherapy cycles, nor did it cause serious adverse effects.

According to current guidance on physical activity in cancer patients produced by the American College of Sports Medicine there is insufficient evidence for the benefit of exercise on cancer-related pain. However, there is strong evidence that aerobic training alone or in combination with resistance training may reduce anxiety, depression, and fatigue in cancer patients [56]. Considering pain as a biopsychosocial phenomenon, is very likely that positive impact of physical activity on psychological functioning may in turn influence pain perception in individuals.

Due to the overall beneficial effect of exercises on functioning and QoL, regular physical activity can be recommended to patients during and after cancer treatment. Such patients should pursue individually tailored exercise programs (in terms of intensity, frequency, duration, and type), adapted to the cancer type and symptoms associated with its treatment [56].

### Music therapy

Music therapy delivered by an experienced therapist as well as listening to one's favourite music may have a positive impact on QoL by reducing emotional, physical, and social distress. The influence of music therapy on the physical manifestations of the disease was assessed in a fairly large number of studies included in the Cochrane review (52 trials,  $n = 3731$ ) [57]. The analysis of their findings shows that music therapy has a beneficial effect on the intensity of anxiety, pain, and fatigue; moreover, it improves the patients' QoL.

Music therapy as a pain reduction method is also suggested by the experts of the American Society of Clinical

Oncology in breast cancer patients [9] as well as in the treatment of pain in cancer survivors [15].

### Mind-body therapies

Mind-body therapies include meditation, hypnotherapy, relaxation, cognitive behavioural therapy, biofeedback, and visualization. The aim of these therapies is to modify various functions of the body through appropriate brain training, which in the case of pain is supposed to activate pain modulation mechanisms. It is also known that every kind of pain as a biopsychosocial phenomenon is closely associated with emotions (stress, anger, anxiety, and mood), which may affect pain intensity. On the other hand, mental distress may intensify pain sensation; hence, psychological therapies are recommended for all types of pain, regardless of their aetiology [58].

The last decade has seen an increase in the number of publications on the use of mind-body therapy in cancer patients during and after active treatment. The studies are highly heterogeneous, but the evidence for the efficacy of psychological methods in pain therapy is robust and consistent [59].

Psychological therapies are recommended by the American Society of Clinical Oncology as an adjunct in the treatment of pain in breast cancer patients and in patients after cancer treatment [9, 12].

Scientific evidence suggests that hypnotherapy can be effective in the prevention and treatment of nausea, vomiting, and hot flashes in women with breast cancer [60]. Above all, however, hypnotherapy has a proven analgesic effect in cancer patients. Reviews and clinical trials provide strong scientific evidence that hypnotherapy reduces pain to a moderate or strong degree in various types of cancer during treatment, diagnostic, and surgical procedures, which includes pain associated with cancer treatment (e.g. mucositis of the oral cavity) [61]. Hypnotherapy is also suggested by the American Society of Clinical Oncology experts as a useful adjunct in pain management in breast cancer patients [9].

Psychological techniques with strong proven efficacy in pain management in cancer patients include guided imagery, which reduced cancer pain, and cognitive behavioural therapy, which reduced pain and stress in patients with various types of cancer in clinical trials [61].

Clinical studies and analyses demonstrate that mindfulness-based therapies may also be helpful in multimodal pain management in cancer patients because they may modulate the patient's emotional attitude to pain and other stressors by redirecting attention away from unpleasant sensations. There are few studies devoted specifically to this method, but mindfulness training was noted to reduce physical pain as well as anxiety, depression, and stress in cancer patients [61].

### Conclusions

Complementary and alternative medicine techniques are increasingly being used by cancer patients. As part of integrative medicine, some CAM techniques can be successfully incorporated into management of cancer patients to

**Table 1.** Analgesic effect of given complementary and alternative methods in cancer patients, and the quality of evidence, based on references listed

Complementary and alternative method	Clinical outcome	References
Acupuncture	<ul style="list-style-type: none"> <li>– Reduction of pain caused by tumour</li> <li>– Reduction of pain caused by surgery</li> <li>– Lack of reduction of pain caused by radiotherapy</li> <li>– Inconsistent evidence on reduction of pain caused by chemotherapy and hormone therapy</li> </ul>	10, 27, 30, 31, 35, 36
TENS	Inconsistent evidence on pain reduction	46–48
Massage	Inconsistent evidence on pain reduction	50–52
Physical exercises	Inconsistent evidence on pain reduction	55, 56
Music therapy	Possible beneficial effect on pain intensity	57
Mind-body therapies	Consistent evidence on pain reduction	59, 61

TENS – transcutaneous electrical nerve stimulation

alleviate symptoms caused by cancer or cancer treatment. The available data from clinical trials supports the effectiveness of acupuncture, massage, physical exercises, music therapy, and mind-body therapies as adjunct therapies for the alleviation of pain in cancer patients, although the evidence is not strong. In clinical practice, however, the weak or inconsistent evidence does not exclude the possible analgesic effect of CAM in each cancer patient, particularly when standard pain management fails or induces serious side effects. Table 1 summarizes the evidence on pain reduction coming from RCTs, reviews, and meta-analyses discussed in this paper. Analysing the impact of acupuncture on pain intensity, the beneficial effect depends on the underlying causative factor of cancer-related pain syndrome.

The growing popularity of CAM as an alternative to allopathic medicine, otherwise known as Western medicine, should encourage healthcare professionals to familiarize themselves with the current scientific approach to these methods. Based on the available knowledge, physicians should also be capable of advising the patient as to which CAM can be used safely, which are contraindicated, and what therapeutic analgesic effects they may expect.

Nonetheless, the results presented in the paper must be interpreted with caution, and several limitations should be borne in mind. The main limitation is the relatively low quality of clinical trials supporting the efficacy of CAM in cancer pain management, mainly due to different study designs and inconsistency in methodological terms, small groups of patients, heterogeneity of patients in terms of type of cancer, its localization and stage of disease, and the variety of outcome measures reported by patients. However, in clinical practice integrative approach to cancer pain management may improve the quality of pain treatment and patients' QoL.

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