

Complementary Therapies for Symptom Management in Cancer Patients

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Abstract

Cancer patients are often poly-symptomatic which distressingly affects their quality of lives (QOLs). Although, conventional management provides adequate symptom control, yet is coupled with some limitations. Complementary therapies (CTs) have shown beneficial effects in cancer patients for symptomatic relief. The aim of this article is to provide evidence-based review of commonly used CTs for symptom management in cancer care. Hypnosis has promising evidence to be used for managing symptoms such as pain, chemotherapy-induced nausea/vomiting, distress, fatigue, and hot flashes. Guided imagery increases comfort and can be used as a psycho-supportive therapy. Meditation substantially improves psychological function, mental health, and QOL. Cognitive behavioral therapies effectively reduce pain, distress, fatigue, anxiety, and depression; and improve subjective sleep outcomes along with mood and QOL. Yoga has short term beneficial effects for anxiety, depression, fatigue, perceived stress, QOL, and well-being. T'ai Chi and qigong are beneficial adjunctive therapies for supportive cancer care, but their role in reducing cancer pain is not well proven. Acupuncture is effective for reducing treatment related side-effects, pain and fatigue. Other therapies such as massage techniques, energy therapies, and spiritual interventions have also demonstrated positive role in managing cancer-related symptoms and improve overall well-being. However, the clinical effectiveness of these therapies for symptom management in cancer patients cannot be concluded due to poor strength of evidence. Nonetheless, these are relatively free from risks and hence can be given along with conventional treatments. Only by tailoring these therapies as per patient's beliefs and preferences, optimal patient-centered holistic care can be provided.

Keywords: Cancer, complementary therapies, mind-body therapies, pain, quality of life

INTRODUCTION

Survival rates of cancer patients are rapidly increasing over the last decade due to the advent of multi-modal anti-cancer treatments.^[1] The newer treatments have shifted the disease paradigm from a serious fatal illness to a chronic illness.^[2] During illness, survivors experience multitude of distressing symptoms such as pain, fatigue, anxiety, depression, insomnia, lymphedema, hot flashes, and nausea/vomiting.^[3]

The conventional treatment for managing these symptoms is often unacceptable due to associated side-effects. With the increased longevity after cancer diagnosis, patients prefer to take treatments which improve their quality of lives (QOLs).^[4] The use of complementary/alternative therapies to improve health and QOLs is increasing among both general population and cancer patients.^[5,6] National Institute for Clinical Excellence describes complementary therapies (CTs) as those which are “used alongside orthodox

treatments with the aim of providing psychological and emotional support through the relief of symptoms.”^[7] For around two decades, CTs have been integrated with palliative care (PC) services as both intend for holistic patient care.^[8,9] Nonetheless, these therapies are coupled with some anecdotal or hearsay misunderstandings and lack of scientific evidence. Thus, despite the fact that the patients show noteworthy interest in using these therapies, they may remain deprived of their benefits.^[7,9] In this article, we aim to provide an evidence based review of commonly used CTs available for symptomatic relief in cancer patients.

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The National Institute of Health Center for Complementary and Alternative Medicine (NCCAM) classified CTs into five domains-Mind-Body Medicine, Natural Product Based Therapies, Manipulative and Body-Based Practices, Energy Medicine and Whole Medical Systems.^[10] NCCAM, later renamed as National Center for Complementary and Integrative Health,^[11] classified complementary health approaches into two subgroups-natural products, and mind and body practices. The approaches which could not fit into both of these were grouped as other complementary health approaches [Table 1].^[12]

COMMON COMPLEMENTARY THERAPIES USED FOR CANCER-RELATED SYMPTOMS

Mind-body therapies

Mind-body therapies focus on the bodily interactions with the mind, brain and behavior in a way to augment mind's capacity to improve body's symptoms and functions.^[13,14] It includes both concentration based and movement based therapies. The former includes techniques such as hypnosis, guided imagery, and cognitive behavioral therapy (CBT), while the latter includes techniques such as yoga, qigong, and T'ai Chi.^[15] These therapies are used for managing symptoms such as pain, fatigue, nausea, dyspnea, and sleep disturbances.^[14,16] These interventions are inexpensive, have negligible side-effects and can be taught to patients to practice independently. These enrich and refine the thought process, induce optimism for coping with symptoms, improve mood, reduce anxiety, and stress due to illness and increase relaxation.^[17] Pain perception,

thus, gets reduced due to the effect on psychological factors such as stress, anxiety, anger, depression, and fear.^[18]

Biofeedback

It is a therapeutic tool by which an individual learns to control autonomic physiological activities to improve health. Validated instruments measure physiologic changes such as skin temperature, brain waves, pulse rate, heart function, breathing pattern, and muscle tension. Based on the activity measured, biofeedback is of five major types-thermal, electro-myographic, electro-dermal, respiration, and finger pulse. The audio/visual changes of physiological functions that result from altered behavior and thoughts are noted by the instruments and interpreted by trained therapists. The process is repeated as needed to achieve required control of symptoms.^[19] It has been demonstrated that biofeedback is useful for improving QOL and reducing cancer-related pain.^[20]

Hypnosis

It is a psychotherapeutic practice where a health-care hypnotist induces a highly relaxed mental state whereby patient's mind is receptive for therapeutic suggestions.^[16] Distractions are prevented in this state of altered consciousness. This allows the patient to focus attention on a particular symptom, illness, or problem.^[14] Components of hypnosis interventions are described in Figure 1.^[21]

Hypnosis had been introduced around 200 years ago^[20,21] and has been researched extensively for variety of health conditions such as skin disorders,^[16] temporomandibular disorders,^[22] fibromyalgia syndrome,^[23] insomnia,^[24] anxiety,^[25] irritable bowel syndrome,^[26] smoking cessation,^[27] labor/childbirth,^[28] reducing body weight,^[29] hot flashes,^[30] tinnitus,^[31] asthma,^[32] headaches/migraines,^[33] pain,^[34] hypertension^[35] and cancer.^[35]

Although hypnosis is not widely practised in clinical set-up, yet evidence suggests that nearly 90% of patients would prefer to use this technique for managing side-effects manifesting due

Table 1: Types of complementary health approaches

| Complementary health approach | Examples |
|---------------------------------------|--|
| Natural products | Herbs/botanicals Vitamins Minerals Probiotics |
| Mind and body practices | Yoga Chiropractic and osteopathic manipulation Massage therapy Meditation Acupuncture Relaxation techniques (e.g., guided imagery, breathing exercises, progressive muscle relaxation) Qigong T'ai Chi Hypnotherapy Healing touch Movement therapies (e.g., Trager psychophysical integration, feldenkrais method, alexander technique, Pilates, Rolfing structural integration) |
| Other complementary health approaches | Traditional healers Ayurvedic medicine Traditional Chinese medicine Homeopathy Naturopathy |

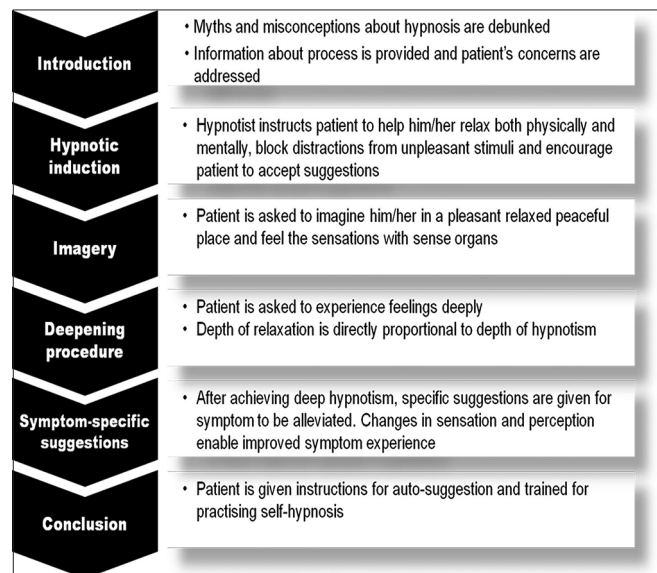


Figure 1: Components of hypnosis interventions

to cancer treatment.^[36] In 1996, National Institute of Health technology assessment panel declared strong evidence for using hypnotherapy to reduce cancer pain.^[37] A plethora of evidence is available to demonstrate its efficacy in alleviating cancer pain in both adults and children.^[38] A summary of systematic reviews (SRs)/meta-analysis for the use of hypnosis in oncology settings is described in Table 2. It is affirmed that hypnotherapy has sufficient evidence to be used for symptom control in cancer patients.^[43]

Guided imagery

It is a psychotherapeutic technique in which an individual creates images to visualize the desired outcome. It is defined as “any of various techniques (as a series of verbal suggestions) used to guide another person or oneself in imagining sensations and especially in visualizing an image in mind to bring about a desired physical response (as a reduction in stress, anxiety, or pain).”^[44] Generally, it begins with relaxation, releasing distractions from the mind and then visualizing images related to physical and mental healing. It can be performed individually or in group settings, can be self-conducted or performed under the observation of trained guide, can be practised alone or with music and other relaxation therapies.^[45]

Interactive-guided imagery is an approach whereby patients are evoked by a practitioner to use their inner resources for creating images to heal their bodies.^[46] During this process, one connects with the subliminal mind^[45] and emotions felt during visualization modulate the neuro-active peptides secreted by the body in a similar fashion as it would to an actual event.^[46] Factors affecting outcomes from this therapy are – imaging ability, outcome expectancy,^[47] and time spent for practice.^[45]

It has been extensively used to determine the effects on various physiological systems^[46] and health conditions such as fibromyalgia, cardiac disorders, stroke rehabilitation, multiple sclerosis, interstitial cystitis, cancer, and pain.^[45,48] Studies have been conducted to demonstrate the role of imagery in managing cancer-related symptoms such as pain, QOL, nausea/vomiting, anxiety, fatigue, and stress.^[17,45,47,49-52] However, SR by Roffe *et al.*,^[53] portrayed that it increases comfort and can be used as a psycho-supportive therapy. Later, a review stated that in three out of five studies pain intensity and distress due to pain

was reduced when guided imagery was given as an intervention in cancer patients.^[54]

Progressive muscle relaxation

Introduced in the early 1900s by Jacobson, progressive muscle relaxation (PMR) is one of the techniques used to evoke “relaxation response” of the body. “Relaxation response” comprises of various physiological and psychological events resulting from an overall reduction in sympathetic nervous system activity. During PMR major muscles of the body are systematically tensed and relaxed, and attention is paid on the sensations felt during the process.^[55] This technique has evolved to various modifications such as jaw relaxation, abdominal breathing, or focused breathing.^[17]

PMR alone has shown beneficial results for chemotherapy-induced nausea/vomiting,^[56] mental health, QOL,^[57] pain, and fatigue.^[17,58] Similar results are observed when PMR is given along with guided imagery^[59,60] or biofeedback.^[61] However, SR of seven studies by Jane *et al.*,^[62] did not yield promising results for effects of PMR given along with guided imagery for alleviating pain in cancer patients.

Meditation/mindfulness-based stress reduction

Meditation is a mental exercise which increases the awareness of thoughts running in mind and empowers mind to focus on a single target for as long as desired. Its cultural roots are embedded in the traditional Eastern systems. Mindfulness-based stress reduction (MBSR) is a meditation technique usually explored in the oncology setting.^[16,20] It was initiated at the Stress Reduction Clinic at the University of Massachusetts Medical Center in 1979. It is based on the principle of “Present Moment Awareness” which allows one to pay attention on present moment only and be nonjudgmental to new situations arising in the next moment.^[63]

A meta-analysis of 29 studies demonstrated moderate effect of MBSR in reducing anxiety, stress, distress, and depression; and in enhancing QOL of healthy individuals.^[64] Another meta-analysis of studies from the diverse clinical population (i.e., anxiety, depression, pain, cancer, and cardiovascular disorders) depicted medium statistically significant effect of MBSR on both physical and mental health of the population studied.^[65]

Table 2: Summary of systematic reviews/meta-analysis for use of hypnosis in oncology settings

| Author | Type of study | Population studied | Outcomes/conclusions |
|---|---|-----------------------------------|---|
| Sheinfeld Gorin <i>et al.</i> ^[39] | Meta-analysis (37 studies) | Cancer | Psycho-social interventions (including hypnosis) have medium size effect on pain severity and interference |
| Richardson <i>et al.</i> ^[40] | SR (six RCTs) | Cancer | Valuable tool for reducing chemotherapy-induced nausea and vomiting in pediatric cancer patients Further research was indicated to prove the same for adult patients |
| Rajasekaran <i>et al.</i> ^[41] | SR (27 studies-one RCT, one observational, one retrospective survey, 24 case studies) | Terminally ill adults with cancer | Symptoms like anxiety, depression, and overall well-being were improved Poor strength of evidence |
| Cramer <i>et al.</i> ^[42] | SR (13 RCTs) | Breast cancer | Promising evidence for managing symptoms like pain, distress, fatigue, nausea and hot flashes |

RCT: Randomized control trial, SR: Systematic review

Previous literature in cancer population demonstrates that MBSR is associated with enriched QOL^[66] and sleep quality^[67,68] reduced stress,^[66-68] fatigue,^[67] sleep disturbances,^[67] mood fluctuations,^[67,68] and caregiver stress.^[69] A summary of studies based on mindfulness-based interventions in cancer patients is provided in Table 3. It can be implicated that MBSR can substantially improve psychological function, mental health and QOL in cancer patients.^[72-74]

Although effects of MBSR have been studied for alleviating chronic pain, yet its role on cancer-related pain is not widely researched.^[14] Semi-structured interviews conducted by Kvillemo and Bränström^[75] described less physical pain experienced by cancer patients receiving MBSR intervention. Body scan meditation of MBSR not only substantially reduced pain but also improved overall physical health in terminally ill cancer patients.^[76] Supportive therapy based on mindfulness has recently been proposed to address sufferings of PC patients.^[77]

Cognitive-behavioral therapy

Thought process of an individual has a direct and sequential effect on his/her feelings, emotions and behavior. CBT is based on the concept that to change patients’ behavior, their emotions need to be changed.^[78] A trained therapist assists the

patients in identifying challenging thoughts and then altering them to control the response towards disease symptoms. This is done using counseling approach or programmed education.^[17] It involves techniques such as autogenic training, biofeedback, hypnosis, imagery, meditation, problem-solving, and systematic desensitization.^[79]

In 14 out of 21 studies reviewed, Kwekkeboom *et al.*,^[17] demonstrated that CBT was effective in improving pain, fatigue, or sleep disturbances in cancer patients. Table 4 summarizes studies demonstrating the use of CBT in oncology settings. Considering the burden of the disease, special requirements in advanced cancer patients, and effectiveness of psychosocial interventions like CBT there is a need to individualize them for patients.^[85,86]

Music therapy

Music has been used extensively since ages for its healing and curative power towards disease or distress. The scientific basis of music therapy (MT) evolved after World War II. Since then, the meaning and scope of application of MT have undergone many developments. However, the emergence of MT as a discipline is relatively new.^[87]

American MT Association defines MT as “the clinical and evidence-based use of music interventions to accomplish

Table 3: Summary of systematic reviews/meta-analysis for use of mindfulness-based interventions in oncology settings

| Author | Type of study | Population studied | Outcomes/conclusions |
|--------------------------------------|--|--------------------|--|
| Ledesma and Kumano ^[70] | Meta-analysis (ten studies-four RCTs and six non-RCTs) | Cancer | Improvement in mental health May assist in psychosocial adjustment |
| Cramer <i>et al.</i> ^[71] | Meta-analysis (three RCTs) | Breast cancer | Some evidence for effectiveness in enhancing psychological health |
| Zainal <i>et al.</i> ^[72] | Meta-analysis (nine studies-two RCTs, seven others) | Breast cancer | Moderate to large positive effect size on symptoms like stress, depression and anxiety |
| Zhang <i>et al.</i> ^[73] | Meta-analysis (seven RCTs) | Cancer | Mindfulness-based therapies effectively lower anxiety and depression for ≤12 weeks |
| Huang <i>et al.</i> ^[74] | Meta-analysis (nine studies-four RCTs and five non-RCTs) | Breast cancer | Significant positive effect on symptoms such as anxiety, depression, and stress Improvement in psychological function and QOL |

RCTs: Randomized control trials, QOL: Quality of live

Table 4: Summary of systematic reviews/meta-analysis for use of cognitive-behavioral therapy in oncology settings

| Author | Type of study | Population studied | Outcomes/conclusions |
|---------------------------------------|--|-----------------------------|---|
| Tatrow and Montgomery ^[79] | Meta-analysis (20 studies) | Breast cancer | Reduction in distress and pain scores |
| Kangas <i>et al.</i> ^[80] | SR (119 RCTs and non-RCTs) and meta-analysis (57 RCTs) | Cancer | Psychosocial interventions (including CBT) have been proven equally effective as exercise in reducing fatigue related to cancer |
| Mustafa <i>et al.</i> ^[81] | SR (ten RCTs-three for CBT and seven others) | Metastatic breast cancer | Some evidence of psychological interventions for reducing psychological symptoms Short-term benefit for improving survival |
| Jassim <i>et al.</i> ^[82] | SR (28 RCTs-24 investigating CBT and four others) | Nonmetastatic breast cancer | Favourable effect on managing mood disturbances, anxiety and depression |
| Garland <i>et al.</i> ^[83] | SR (12 studies-eight RCTs, four non-RCTs) | Cancer | Improvements in sleep along with fatigue, mood and QOL with CBT for insomnia (CBT-I) |
| Johnson <i>et al.</i> ^[84] | SR and meta-analysis (eight RCTs) | Cancer | CBT-I showed long-term improvements in subjective sleep outcomes It was strongly recommended to use CBT-I in cancer patients |

RCTs: Randomized control trials, CBT: Cognitive-behavioral therapy, SR: Systematic review

individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved MT program.⁹⁸ Patients are engaged by trained music therapist in activities like listening to music, singing, etc.⁸⁹ Music produces multi-dimensional effects on body functions. It stimulates autonomic nervous system and releases endorphin from the brain. It allows spiritual strengthening at a psychological level.⁵¹ This allows expressing oneself, easing communication and increases relaxation.⁸⁹

It is now being extensively practised in various fields of medicine and rehabilitation.^{51,87} Kamioka *et al.*,⁹⁰ depicted in their summary of SRs that MT has potential to improve the quality of sleep, symptoms of depression, and other bodily functions.

MT has gained popularity in PC setting as it provides patients' comfort, relaxation, reducing symptoms and allows them to face end-of-life with dignity.⁹¹ It has been used during anti-cancer treatments, for symptomatic relief, improving QOL and providing spiritual healing.⁹² MT coupled with guided imagery, shows beneficial effects on chemotherapy-induced nausea/vomiting.⁵¹ Many SRs and meta-analysis have been performed which demonstrate the role of MT in improving cancer-related symptoms [Table 5].

Yoga

The origins of yoga can be traced to more than 4000 years ago in India. It is a Sanskrit based word (*yuj*) meaning to unite, join or bind. It promotes health by uniting mind and body. The key elements of yoga are *pranayama* (breathing exercises), *asanas* (postures), and *dhyana* (meditation).⁹⁸ It focuses on four main principles - (1) the human body is a holistic entity, (2) every individual is unique, (3) empowers self and (4) healing depends on individuals' state of mind.⁹⁹ Some of the styles of yoga are *hatha yoga*, *tibetan yoga*, *restorative yoga*, *iyengar yoga*, *sudarshan kriya yogic breathing* and *vinyasa yog*.¹⁶

It has been extensively used by both healthy and sick individuals to alleviate stress, improve flexibility, and enhance relaxation

and muscular strength. Its benefits are evident at the cellular, physiological and psychological levels.¹⁰⁰ It reduces stress which is responsible for exacerbating tumor growth. It also improves overall well-being, QOL and promotes healing.⁹⁹

The majority of the studies for the role of yoga in symptom management involves breast cancer patients. Evidence from ten SRs suggests that yoga has short term beneficial effects for anxiety, depression, fatigue, perceived stress, QOL and well-being. Mixed effects are demonstrated for distress and nonsignificant results for physical health and sleep problems.¹⁰¹ Yoga has shown positive effect for reducing pain^{5,102,103} and lymphedema,^{104,105} but the sustainability of these results after yoga based intervention needs more investigation.

T'ai Chi and Qigong

T'ai Chi chuan (abbreviated as T'ai Chi, also known as taiji) has originated from traditional Chinese martial arts.¹⁰⁶ This Chinese phrase symbolizes "supreme ultimate." It embraces the concept of *chi* or *qi* and *Yin–Yang* forces.¹⁰⁷ Qigong (known as Qi Qong/Chi Kung) is an ancient Chinese practice similar to T'ai Chi. It means cultivating *qi* (energy) through *gong* (i. e., skills gained by practice). Medically, qigong is described as "coordination of gentle exercise and relaxation through meditation and breathing exercise based on the Chinese medicine theory of energy channels."¹⁰⁸

Both are designated as 'meditative movement' or mindful exercises, as the body movements are performed along with deep breathing and awareness.^{107,109} They are considered both as mind-body therapies and energy therapies (ET).¹⁰⁸ They encourage the flow of *qi* (life force or vital energy) by integrating mind, body and soul, and restore balance in them. When the energy flows freely, blockage/stagnation of energy in body's energy channels is cleared. Restoring the energy balance restores health and even prevents diseases.^{107,110} Though, both share the common principle of regulating the body, breath and mind,^{109,111} yet are dissimilar in the level of complexity and ease of learning. T'ai Chi is relatively lengthy and involves complex movements, but qigong is easy to learn, simpler and a repetitive process.¹¹¹

Table 5: Summary of systematic reviews/meta-analysis for use of music interventions in oncology settings

| Author | Type and number of study | Population studied | Outcomes/conclusions |
|---|--|---|--|
| Zhang <i>et al.</i> ⁹³ | SR and meta-analysis (32 RCTs) | Cancer | Positive effects on psychological outcomes like anxiety and depression, pain and QOL Music interventions were accepted by patients |
| Nightingale <i>et al.</i> ⁹⁴ | SR (13 RCTs) and meta-analysis (four studies) | Cancer | No positive effect of MT on anxiety This could be attributed to methodological rigor and small sample size |
| Boehm <i>et al.</i> ⁹⁵ | SR and meta-analysis (13 studies-11 RCTs and two CCTs) for various art therapies-including six studies on MT | Breast cancer | Possible positive effect on anxiety |
| Tsai <i>et al.</i> ⁹⁶ | Meta-analysis (21 studies-19 RCTs and two non-RCTs) | Cancer | Improves cancer-related symptoms (like pain, fatigue, depression and anxiety mainly in adults), especially when patients themselves chose the music as compared to the researchers |
| McConnell <i>et al.</i> ⁹⁷ | SR (three RCTs) | End-of life care or life-limiting illness | Possibility of reducing pain in palliative care set up High risk of bias with studies included |

RCT: Randomized control trial, CCT: Controlled clinical trial, MT: Music therapy, SR: Systematic review

Both have significant and consistent evidence for improving an array of health conditions like bone and brain health, cardiovascular health, cognitive functioning, diabetes and metabolic syndrome, functional balance, fatigue, immune function, musculoskeletal disorders, obesity, pulmonary conditions, psychological symptoms, QOL, self-efficacy, sleep disorders, pain and cancer.^[106-109] Table 6 summarizes studies employing T'ai Chi/qigong in oncology settings. Despite the limitations of the research evidence, it can be stated that T'ai Chi and qigong are beneficial adjunctive therapies for supportive cancer care.^[116,117] Further studies should be based on stringent research methodology, and their role for alleviating cancer pain should also be investigated.

Acupuncture

It originated from traditional Chinese medicine over 2000 years ago.^[14,118] It involves insertion of hair-thin needles deep into the skin by skilled practitioners at specific sites known as acupuncture points.^[118,119] After inserting the needles, the acupuncture points are stimulated through manual manipulation (acupressure), electrical pulses (electro-acupuncture), heat (moxibustion) or laser light (laser acupuncture).^[14,119]

It is based on the philosophy of balancing *yin* and *yang* energies^[119,120] which correspond to the theory of balancing sympathetic and parasympathetic activity.^[120] The literature demonstrates its benefit in managing medical conditions such as rheumatoid arthritis, epilepsy, back pain, labor pain, drug addiction, headaches, and postoperative nausea/vomiting.^[121] It has been intensely used in cancer patients for management of symptoms such as pain, fatigue, xerostomia, nausea/vomiting, hot flashes, insomnia, anxiety, depression, dyspnea, and leucopenia.^[122]

A large number of studies have been performed to support the role of acupuncture in managing pain and other cancer-related symptoms [Figure 2]. Due to the heterogeneity of methodologies of studies, cancer populations and techniques used, Cochrane SR concluded that the evidence is insufficient to predict its effectiveness in reducing cancer pain.^[123] Later, Hu *et al.*,^[124] revealed that cancer pain is better alleviated when acupuncture is given along with pharmacotherapy rather than pharmacotherapy alone. Chiu *et al.*,^[125] also demonstrated

its effectiveness in relieving cancer pain related to the tumor itself or resulting from surgery. Results for relieving pain due to chemotherapy or radiotherapy or hormonal therapy were ineffective. Studies demonstrate positive effects of acupuncture for managing cancer-related fatigue as well. Various SRs^[126-128] and meta-analysis^[129] suggest possible benefits of acupuncture as CT, but the evidence is insufficient to draw a significant conclusion for relieving fatigue. Garcia *et al.*,^[130] highlighted its role to control hot flashes in breast cancer patients, but the strength of the evidence was unconvincing. Similarly, it has shown favorable effects for managing hiccups^[131] and preventing and/or treating xerostomia,^[132] but the methodological quality of studies was low. Stimulation of point Pericardium 6 (P6) by acupressure or needle can reduce chemotherapy-induced nausea/vomiting. However, current evidence from literature provides mixed results.^[133]

More recent SRs have depicted that acupuncture is effective in cancer patients for reducing side-effects due to chemotherapy or radiotherapy,^[134] pain,^[134,135] and fatigue,^[135] thereby improving QOL.^[135] It is a safe therapy^[133] with rare complications and has a promising potential as CT for symptom control.

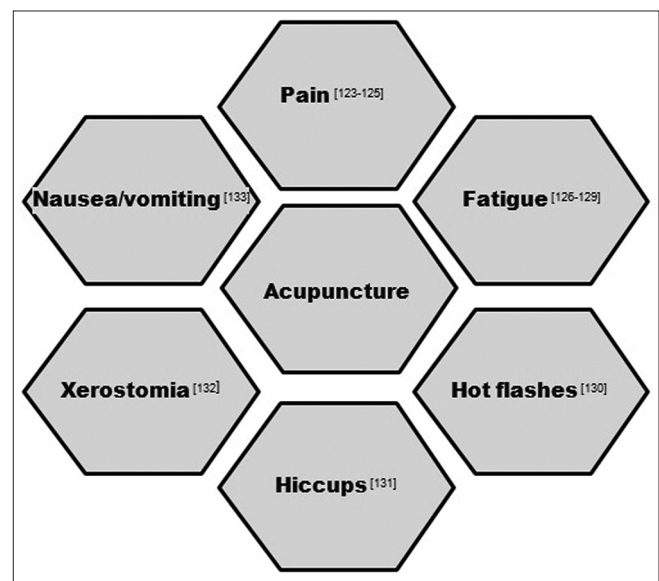


Figure 2: Role of acupuncture in managing cancer-related symptoms

Table 6: Summary of systematic reviews/meta-analysis for use of T'ai Chi/qigong in oncology settings

| Author | Type of study | Population studied | Outcomes/conclusions |
|---------------------------------------|--|--------------------|--|
| Lee <i>et al.</i> ^[112] | SR (three RCTs and four nonrandomized studies) | Breast cancer | Strength of evidence for using T'ai Chi for supportive care was not convincing |
| Zeng <i>et al.</i> ^[111] | Meta-analysis (13 RCTs) | Cancer | T'ai Chi or qigong have positive effects for fatigue, QOL, immune function and cortisol levels Huge risk of bias was associated with the included studies |
| Fong <i>et al.</i> ^[113] | Single-blinded non-RCT | Breast cancer | Qigong has a potential to temporarily improve circulatory status and lymphedema |
| Larkey <i>et al.</i> ^[114] | RCT | Breast cancer | Improvement in fatigue when qigong/T'ai Chi easy (an easier adaption of traditional T'ai Chi) was given as intervention |
| Zhang <i>et al.</i> ^[115] | RCT | Lung cancer | Improvement in fatigue related symptoms observed for patients undergoing chemotherapy |

RCTs: Randomized control trials, SR: Systematic review

Methodologically, strong studies are indicated for future to provide concrete evidence.

Trans-cutaneous electrical nerve stimulation and scrambler therapy

Trans-cutaneous electrical nerve stimulation (TENS) is an electro-analgesic technique which reduces pain on the basis of pain gate mechanism. Electrical impulses stimulate A-beta nerve fibers which in-turn inhibits transmission via A-delta and C-fibers, thereby alleviating pain.^[136] It has been used on a variety of painful conditions such as neurogenic, musculoskeletal, visceral, and cancer pain.^[137] Although the Cochrane SR of three RCTs was inconclusive to depict the value of TENS in managing cancer-related pain,^[138] yet its role as an adjunct for cancer pain management cannot be denied.^[139] Giuseppe Marineo developed a similar approach known as Scrambler therapy, also known as MC5-A or Calmare Therapy.^[140] Mixing or “scrambling” of painful and nonpainful information is the underlying mechanism for this therapy to alleviate pain. It comprises five sets of electrodes that are placed around the painful site on nonpainful dermatome. The therapy is given for ten consecutive days for 30–45 min/day.^[136,140] It has been used for a variety of malignant and nonmalignant painful conditions with substantial benefits. However, the outcomes are dependent on practitioners’ skills; and multi-center, placebo-controlled, double-blinded studies are needed to strengthen its effectiveness.^[140]

Massage techniques

Ancient scriptures from India, China and Japan, refer to the use of massage. It refers to pressure application by trained therapist to soft tissues of the body by pressing, rolling, kneading, rubbing or other movements.^[141] Stimulation of pressure receptors increases vagal activity and reduces cortisol levels.^[142] It is used for promoting circulation, reducing pain, eliminating waste products from the body, and relaxing muscles and nervous tissue.^[14,141,143] A meta-analysis of 37 studies by Moyer *et al.*,^[144] demonstrated that massage therapy significantly reduces anxiety and depression. Concurrently, a recent review demonstrated its favorable effects on various pain syndromes, autoimmune conditions, hypertension, prenatal and postnatal developmental conditions etc., as well.^[142]

Commonly used therapeutic massage techniques in oncology are aromatherapy, acupressure, Swedish massage, and reflexology.^[14] With debunking of myth of metastasis due to massage,^[145] its use in oncology community for symptom management is increasing. It helps in alleviating both physical and psychological symptoms due to cancer and its treatment.^[146] It is a skilled and systematic touch which needs to be delivered by trained hands in cancer patients as they are vulnerable for blood clot risk, easy bruising, osteoporosis, peripheral neuropathy or lymphedema.^[145] Evidence from three SRs^[147-149] is encouraging but inconclusive for role of massage in managing symptoms like pain, nausea, depression, anxiety, stress, anger, and fatigue in cancer patients.

Aromatherapy incorporates essential oils derived from plant sources having therapeutic benefits and is given through

massage, inhalation or other means for both specific effects and overall well-being of an individual.^[150] It has shown short-term benefits in improving anxiety and depression in cancer patients^[150] but does not significantly reduce cancer pain.^[150,151] Reflexology has been used for alleviating pain, nausea, anxiety and depression in cancer patients.^[152] The meta-analysis by Lee *et al.*,^[153] specified that surgery-related pain is effectively reduced by massage, and foot reflexology is more effective than aroma or body massage. The clinical effectiveness of massage techniques for symptomatic cancer care cannot be concluded due to poor strength of evidence of studies performed.^[154,155]

Energy therapies and spiritual interventions

Healing can be induced by specific internal (intrapersonal) and external (interpersonal) techniques that assert to use subtle energy (known as *prana*, *ch'i*, *qi* or *spirit*) for curing self and another individual respectively.^[156] Biofield or ETs unblock energy centers of the body and promote physical healing and mental, emotional and spiritual balance.^[157] Moreover, these therapies cause direct effects by inducing relaxation response which blocks neuroendocrine stress response, thus enhancing immunity and other body functions^[158] [Table 7].

Reviews demonstrate the potential of ET for cancer care, symptomatic relief and managing side-effects due to cancer treatment. The benefits observed from these therapies include reduction in pain scores, fatigue, anxiety and stress, and improvement in mood, overall wellbeing and QOL.^[157,159,163-165]

Table 7: Overview of energy therapies

| ET | Description |
|--|--|
| Reiki ^[159-162] | <p>Founded by Mikao Usui</p> <p>Uses four Sanskrit-Reiki symbols that vibrate at a particular frequency and attune an individual to “Universal Life Energy”</p> <p>This energy is transmitted by practitioner to patient by placing hands on body at various positions corresponding to endocrine and lymphatic system</p> <p>Each position is held till the hands of therapist radiate energy. The overall session may last for 45-75 min</p> |
| Healing touch ^[159,163,164] | <p>Founded by Janet Mentgen</p> <p>Temperature, vibration or texture changes correspond to the areas of energy imbalance of body. Such areas are determined by the use of intention and placement of hands in specific sequences both on and off body including the chakras i.e., transducers for the energetic body</p> |
| Therapeutic touch ^[159,163] | <p>Founded by Dolores Krieger</p> <p>Nursing intervention based on energy transfer by placing hands both on and off body</p> <p>Three phases</p> <p>Centering phase - Becoming aware of the helpfulness of therapy for patient</p> <p>Assessment phase - Hand movements from patient’s head to feet to assess signs of energy imbalance like warmth or tingling</p> <p>“Unruffling” phase - Energy congestion is relieved by hand movements over energy field of the patient</p> |

ET: Energy therapy

Pedro *et al.*,^[166] concluded that there is some evidence to support the efficacy of ET for reducing pain and fatigue and promoting relaxation in cancer patients. Furthermore, a review of 30 studies by Henneghan and Schnyer^[167] supported the use of ET for reducing pain and stress, and enhancing QOL in patients needing PC at end-of-life. Similar positive effect of therapeutic touch on symptom management in cancer patients has been reported by Tabatabaee *et al.*,^[168] in their review of six studies. Similar to the CTs described earlier, the use of ETs is supported by limited evidence only and requires high quality systematic empirical research to be conducted.

Spiritual or existential concerns are inevitably associated with life-limiting disease like cancer. Spirituality helps patients in coping up with the emotional distress caused due to disease.^[169-171] Better physical health is reported by cancer patients with greater spiritual well-being or religiosity.^[172] CTs are often perceived to be a source of spiritual support^[173] and are frequently used by those having more spiritual faith.^[174] Patients' spiritual experiences are observed with healing due to ETs or other mindfulness-based CTs.^[175,176]

Oh and Kim^[177] demonstrated in their meta-analysis of 15 studies that spiritual interventions have significant but moderate effect on spiritual well-being, meaning of life, anxiety and depression. Best *et al.*,^[178] included six studies on spiritual interventions in their SR to treat holistic suffering in cancer patients. Though, results indicated positive effect for improving spiritual well-being but were inconsistent due to variability in population, modality and techniques used in the studies. Kruizinga *et al.*,^[179] emphasized in their meta-analysis of 12 studies that spiritual interventions with narrative approach have moderate short term improvement in QOL immediately after the intervention. Sustainability of improved QOL after few months was not established. However, the evidence from all these studies was weak due to heterogeneity of studies involved.

CONCLUSION

The journey from diagnosis to treatment of cancer affects the patients' lives in a variety of ways. Debilitating symptoms arising both due to disease and its treatments consistently hamper their QOLs. CTs aim to provide holistic healing by addressing multivariate symptoms and hence have become popular in the oncology patient community. This extensive review of commonly used CTs is an attempt to provide evidence for suggesting and using them in oncology settings. It was identified that there is no clear-cut demarcation between some of the therapies. CBT includes techniques like hypnosis, imagery, meditation; which are considered as relaxation therapies as well; and have been considerably researched individually or in combination with other therapies. Similarly, spiritual healing is provided not only via spiritual interventions but also is experienced along with music interventions, yoga, meditation or energy healing. Therefore, the review performed for this article is based on the available

literature which involves a variety of combination of CTs. All therapies described here have a potential for symptomatic care in cancer patients. However, recognition of effects of these therapies is barricaded by paucity of systematic high-quality research. Poor study designs with small sample size, varied cancer population, different outcome measures; statistically insignificant results and lack of unanimity on the mechanism of actions lead to limited scientific evidence. Despite the lack of strong evidence, the benefits pertained from CTs cannot be contravened. Acknowledging the need of patient-centered care and to address holistic suffering, the limitations of conventional treatments need to be accepted. It is suggested that high-quality research in this aspect is conducted to provide conclusive findings which will help in collective decision making by both patient and oncologist.

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