

Complementary therapies in controlling side-effects during cancer treatment: A systematic review and meta-analysis

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Abstract

This systematic review evaluated whether reiki had an impact on patients undergoing chemo-therapy, with possible improvement of the following outcomes: fatigue, pain, anxiety and quality of life. Method: Systematic review study with meta-analysis conducted at a tertiary care center. The following databases were searched until July 2020: MEDLINE, LILACS and CENTRAL. Two re-viewers independently examined eligible articles, extracted data and assessed the risk of bias using the Cochrane tool. Results: The analyzes included eight studies and showed that there was a statistically significant for anxiety control (MD = -2.09; 95% CI: -3.00 to -1.19; I² = 51%) and Quality of life (MD = -5.97; 95% CI: -10.70 to -1.25; I² = 97%) but no statistically significant difference was found for the other outcomes analyzed. An analysis of the risk of bias has uncertain methodological limitations in the studies. Conclusions: Although there is anxiety control and improved quality of life, there is a need for the elaboration of randomized clinical trials with larger populations to verify their real performance in controlling some side effects during chemotherapy.

Keywords: Spirituality; Therapeutic Touch; Neoplasms; Complementary therapies

1. Introduction

Cancer is among the diseases that are associated with fear and suffering. People have been trying to deal with cancer for the past decades, but studies show that cancer is still affecting all kind of ages, social background and cultures (MATOURYPOUR ET AL., 2016).

Several treatments are used for cancer, being chemotherapy one of the oldest and most common types, besides radiotherapy, surgery and gene therapy. Chemotherapy is often followed by a number of distressing symptoms, including fatigue, nausea, vomiting, and loss of appetite, as well as behavioral change, i.e. anxiety and depression. Despite the use of medications, patients continue to feel a range of side effects. (LAFRENIERE ET AL., 199; POST-WHITE ET AL., 2013)

Therefore, integrative oncology are seeking for complementary and alternative medicine that is divided into five categories to help diminishing the side effects of cancer and conventional cancer therapies (e.g. surgery, chemotherapy, radiotherapy, and molecular therapy): biological based practices: medicinal herbs, vitamins, and dietary supplements; mind-body techniques: yoga; meditation; mindfulness; art, music and dance therapies; body manipulations: massage, reflexology, physical exercises; energy-based therapies: Reiki, healing touch, qigong; and whole systems: traditional Chinese medicine and Ayur-vedic medicine.

These modalities alongside conventional care can be effective and reduce adverse side-effects (LEE,PITTLER, & ERNST 2008; VANDERVAART ET AL., 2009; FERRAZ ET AL., 2017)

Although, there is no scientific based-evidence on complementary therapies efficiency, such natural healing has been practiced for millenniums. Those therapeutic approaches are mostly from oriental countries, e.g. India with Ayurvedic therapy; China with acupuncture; and Japan with reiki healing touch.

Whether such therapies are practiced either alone or alongside conventional occidental treatments, it will benefit patient, since has a holistic approach that involves body, mind and soul. Among them, there is meditation, massages, healing touch and other procedures that are within complementary practices, according to the National Centre for Complementary and Alternative Medicine (VITALE, 2007; LEE,PITTLER, & ERNST 2008; VANDERVAART ET AL., 2009; AGHABATI, MOHAMMADI & POUR 2010; FITZHENRY ET AL., 2014; DEMIR ET AL., 2015; TABATABAEE ET AL., 2016; FERRAZ ET AL., 2017 & SUZUKI ET AL 2020).

Reiki comes from Japan, is based in hands-on healing, such term is a combination of two Japanese words: rei, a universal spirit; and ki, life energy (MATOURYPOUR ET AL., 2016). Nowadays, it has been practice all over the world and mostly used for pain relief (VANDERVAART ET AL., 2009). As a holistic approach, it does not only improve the physical being, but also psychological, social and spiritual health (FERRAZ ET AL., 2017).

Previously, a systematic review of clinical trials compared reiki and prayer therapy with the usual care among women undergoing childbirth. Although, the review proved great methodological standards, it also has serious limitations regarding the number of published studies so far (FERRAZ ET AL., 2017).

In this way, the current review is necessary to provide more data on the topic, since literature has shown a few studies reporting that complementary therapies increased quality of life of patients undergoing several illnesses (FITZHENRY ET AL., 2014; DEMIR ET AL., 2015; TABATABAEE ET AL., 2016; FERRAZ ET AL., 2017 & SUZUKI ET AL 2020). Moreover, non-pharmacological practices should be taken into consideration to reduce excessive use of allopathic medication in western countries that costs a lot in public health.

Given the above, the aim of this systematic review of randomized controlled trials (RCTs) was to evaluate if reiki is effective for controlling fatigue, pain, anxiety and improving quality of life among patients undergoing chemotherapy.

2. Materials and Methods

The Cochrane Handbook for Intervention Reviews (HIGGIN, GREEN; 2011) guided our choice of methods. The reports adhered to the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) (MOHER, LIBERATI, TETZLAFF, ALTMAN, 2009).

2.1 Eligibility criteria

We included RCTs or quasi-RCTs that compared whether reiki or healing touch is effective among patients undergoing chemotherapy, including any of the following outcomes after receiving the intervention or usual care: fatigue, pain, anxiety and quality of life.

2.2 Data source and searches

Pertinent literature was identified through MEDLINE (from 1966 to July 2020); LI-LACS (from 1982 to July 2020); and Cochrane controlled trials (CENTRAL) (up to July 2020), using the terms spirituality, reiki and neoplasm (Fig 1). A review of relevant refer-ences in previous systematic review and primary studies was carried out.

<p>Medline via Pubmed #1 "Spirituality"[Mesh] OR Spiritualities OR "Reiki"[Mesh] OR "Touch, Therapeutic" OR "Laying on of Hands" OR "Spiritual Healing"[Mesh] OR "Spiritual Therapies" #2 "Neoplasms"[Mesh] OR Benign Neoplasms OR Malignancy OR Neoplasm OR "Neoplasms, Benign" OR "Benign Neoplasm" OR Cancers OR Malignancies OR "Neoplasm, Benign" OR Tumor OR Cancer OR Tumors STRATEGY: #1 AND #2</p> <p>CENTRAL " Spirituality " OR " Spiritualities " OR " Reiki " OR (" Touch, Therapeutic " OR " Laying on of Hands " OR " Spiritual Healing " OR " Spiritual Therapies ") AND Neoplasias OR Câncer OR Cancro OR (Tumor Maligno) OR Neoplasmas OR Tumor OR Tumores OR (Tumores Malignos) OR Neoplasia OR (Neoplasia Benigna) OR (Neoplasia Maligna) OR Malignidade</p> <p>Lilacs Espiritualidade OR Reiki OR (Toque terapêutico) OR (Superposição de mãos) OR (Cura Espiritual) OR (Terapias espirituais) AND Neoplasias OR Câncer OR Cancro OR (Tumor Maligno) OR Neoplasmas OR Tumor OR Tumores OR (Tumores Malignos) OR Neoplasia OR (Neoplasia Benigna) OR (Neoplasia Maligna) OR Malignidade</p>

Fig. 1 Search strategies for MEDLINE via PUBMED; CENTRAL and LILACS.

2.3 Selection of studies

Randomized controlled trials (RCT) or quasi-RCTs. Two reviewers independently screened all titles and abstracts that were identified through literature search. Moreover, both selected potential studies by analysing full-text articles, according to eligibility criteria. There was no language restriction in the selection of articles.

2.4 Data extraction and risk-of-bias assessment

Two reviewers independently screened all the potential quantitative results or critical data from some preselected studies, regarding participants, interventions, control, outcome measurements, follow-up and results. Subsequently, disagreements between reviewers were discussed with a field supervisor to reach a consensus.

Also, reviewers independently assessed risk of bias by using a version of the Cochrane Collaboration's tool for assessing risk of bias (HIGGIN ET AL., 2011), including nine domains: adequacy of sequence generation; allocation sequence concealment; blinding of participants and caregivers; blinding of data collectors; blinding for outcome assessment; blinding of data analysts; incomplete outcome data; selective outcome reporting; and presence of other potential sources of bias not accounted for in the previously cited domains. When incomplete outcome data was reported, reviewers stipulated that low risk of bias consisted of loss to follow-up of less than 10% and a difference in missing data between the intervention and control groups of less than 5%.

2.5 Data synthesis and statistical analysis

We pooled the data to calculate pooled risk ratios (RRs) or mean differences, with 95% confidence intervals (CIs), using a fixed effect model by considering the last follow-up outcome that had been measured in each study included. Heterogeneity was assessed by means of the I2 statistic. All analyses were performed in the Review Manager software (RevMan) (REVIEW MANAGER, 2014).

3. Results

3.1 Selection of titles

A total of 6,171 titles were identified in the databases cited above, but only 34 studies were selected for detailed evaluation. Ultimately, it was found that only eight studies (POST-WHITE ET AL.,2003;TSANG, CARLSON & OLSON,2007; AGHABATI, MOHAMMADI & POUR 2010; CATLIN & TAYLOR-FORD 2011; FITZHENRY ET AL., 2014; DEMIR ET AL., 2015; ORSAK ET AL., 2015; TABATABAEE ET AL., 2016)

that included 644 patients met eligibility criteria for the current review (Fig 2). Full-text articles excluded, with reasons are present in the exclusion table (Table 1).

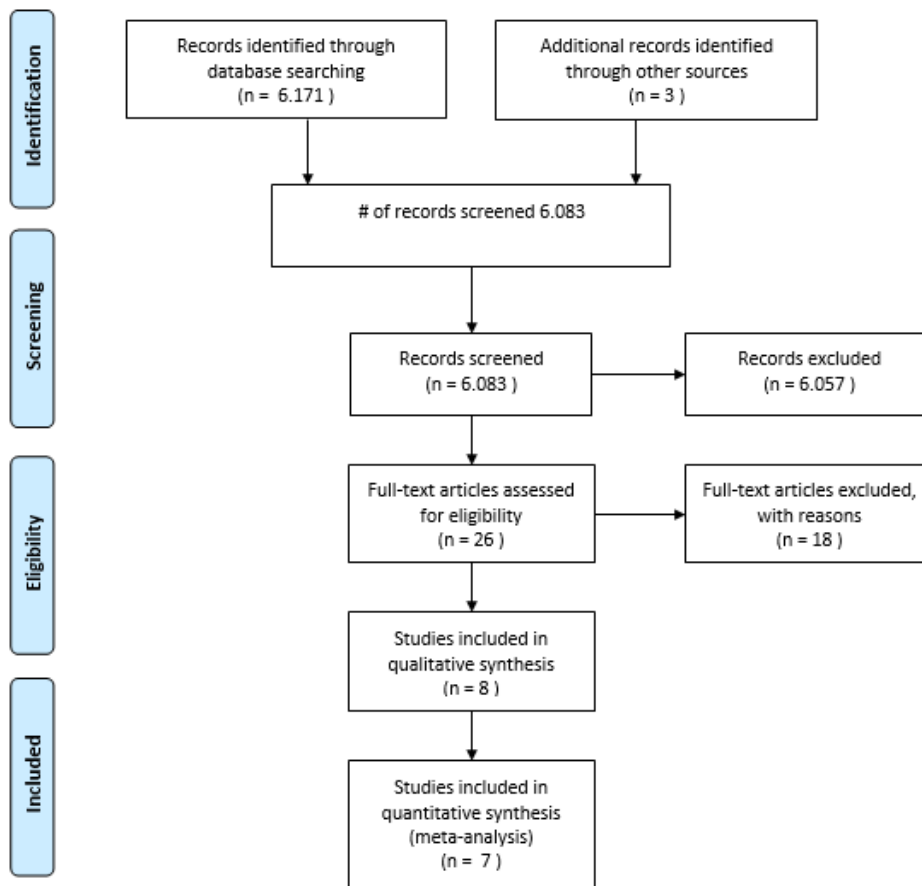


Fig. 2 Flowchart for identifying eligible studies

Reason for exclusion The interventions in the studies were:	Reference
Spiritual counseling	Sajadi M, Niazi N, Khosravi S, Yaghobi A, Rezaei M, Koenig HG5. Effect of spiritual counseling on spiritual well-being in Iranian women with cancer: A randomized clinical trial. <i>Complement Ther Clin Pract</i> . 2018 Feb;30:79-84. doi: 10.1016/j.ctcp.2017.12.011. Epub 2017 Dec 13.
Relaxation meditation (RM)	Steinhauser KE, Alexander S, Olsen MK, Stechuchak KM, Zervakis J, Ammarell N, Byock I, Tulsy JA. Addressing Patient Emotional and Existential Needs During Serious Illness: Results of the Outlook Randomized Controlled Trial. <i>J Pain Symptom Manage</i> . 2017 Dec;54(6):898-908. doi: 10.1016/j.jpainsymman.2017.06.003. Epub 2017 Aug 10.
Palliative care	Betty R. Ferrell, Carly L. Paterson, Mark T. Hughes, Vincent Chung, Marianna Koczywas, and Thomas J. Smith. <i>Journal of Palliative Medicine</i> . Dec 2017. ahead of print http://doi.org/10.1089/jpm.2017.0158
Effectiveness of mind subtraction meditation (MSM)	Yun MR, Song M, Jung KH, Yu BJ, Lee KJ. The Effects of Mind Subtraction Meditation on Breast Cancer Survivors' Psychological and Spiritual Well-being and Sleep Quality: A Randomized Controlled Trial in South Korea. <i>Cancer Nurs</i> . 2017 Sep/Oct;40(5):377-385. doi: 10.1097/NCC.0000000000000443.
Therapeutic touch (TT)	Vanaki Z , Matourypour P , Gholami R , Zare Z , Mehrzad V , Dehghan M . Therapeutic touch for nausea in breast cancer patients receiving chemotherapy: Composing a treatment. <i>Complement Ther Clin Pract</i> . 2016 Feb;22:64-8. doi: 10.1016/j.ctcp.2015.12.004. Epub 2015 Dec 11.
Online spirituality	Rickhi B, Kania-Richmond A, Moritz S, Cohen J, Paccagnan P, Dennis C, Liu M, Malhotra S, Steele P, Toews J. Evaluation of a spirituality informed e-mental health tool as an intervention for major depressive disorder in adolescents and young adults - a randomized controlled pilot trial. <i>BMC Complement Altern Med</i> . 2015 Dec 24;15:450. doi: 10.1186/s12906-015-0968-x.
Brief Psychotherapy (PB)	Elias AC, Ricci MD, Rodriguez LH, Pinto SD, Giglio JS, Baracat EC. The biopsychosocial spiritual model applied to the treatment of women with breast cancer, through RIME intervention (relaxation, mental images, spirituality). <i>Complement Ther Clin Pract</i> . 2015 Feb;21(1):1-6. doi: 10.1016/j.ctcp.2015.01.007. Epub 2015 Feb 3.
Raining intervention, where the focus is on existential issues and	Henoah I, Danielson E, Strang S, Browall M, Melin-Johansson C. Training intervention for health care staff in the provision of existential support to patients with cancer: a randomized, controlled study. <i>J Pain</i>

nurses' perceived confidence in communication	Symptom Manage. 2013 Dec;46(6):785-94. doi: 10.1016/j.jpainsymman.2013.01.013. Epub 2013 Jun 10.
Tibetan Sound Meditation (TSM) program	Milbury K, Chaoul A, Biegler K, Wangyal T3, Spelman A, Meyers CA4, Arun B5, Palmer JL, Taylor J, Cohen L. Tibetan sound meditation for cognitive dysfunction: results of a randomized controlled pilot trial. <i>Psychooncology</i> . 2013 Oct;22(10):2354-63. doi: 10.1002/pon.3296. Epub 2013 May 9.
Intercessory prayer	Olver IN, Dutney A. A randomized, blinded study of the impact of intercessory prayer on spiritual well-being in patients with cancer. <i>Altern Ther Health Med</i> . 2012 Sep-Oct;18(5):18-27.
Spiritual therapy	Jafari N, Zamani A, Farajzadegan Z, Bahrami F, Emami H, Loghmani A. The effect of spiritual therapy for improving the quality of life of women with breast cancer: a randomized controlled trial. <i>Psychol Health Med</i> . 2013;18(1):56-69. doi: 10.1080/13548506.2012.679738. Epub 2012 Apr 26.
Individual Meaning-Centered Psychotherapy (IMCP)	Breitbart W, Poppito S, Rosenfeld B, Vickers AJ, Li Y, Abbey J, Olden M, Pessin H, Lichtenthal W, Sjoberg D, Cassileth BR. Pilot randomized controlled trial of individual meaning-centered psychotherapy for patients with advanced cancer. <i>J Clin Oncol</i> . 2012 Apr 20;30(12):1304-9. doi: 10.1200/JCO.2011.36.2517. Epub 2012 Feb 27.
Relaxation response therapy (RRT)	Beard C, Stason WB, Wang Q, Manola J, Dean-Clower E, Dusek JA, Decristofaro S, Webster A, Doherty-Gilman AM, Rosenthal DS, Benson H. Effects of complementary therapies on clinical outcomes in patients being treated with radiation therapy for prostate cancer. <i>Cancer</i> . 2011 Jan 1;117(1):96-102. doi: 10.1002/cncr.25291. Epub 2010 Aug 27.
Meaning Centered Group Psychotherapy (MCGP)	Breitbart W, Rosenfeld B, Gibson C, Pessin H, Poppito S, Nelson C, Tomarken A, Timm AK, Berg A, Jacobson C, Sorger B, Abbey J, Olden M. Meaning-centered group psychotherapy for patients with advanced cancer: a pilot randomized controlled trial. <i>Psychooncology</i> . 2010 Jan;19(1):21-8. doi: 10.1002/pon.1556.
Palliative care	Steinhauser KE, Alexander SC, Byock IR, George LK, Olsen MK, Tulsky JA. Do preparation and life completion discussions improve functioning and quality of life in seriously ill patients? Pilot randomized control trial. <i>J Palliat Med</i> . 2008 Nov;11(9):1234-40. doi: 10.1089/jpm.2008.0078.
Music therapy (MT)	Hanser SB, Bauer-Wu S, Kubicek L, Healey M, Manola J, Hernandez M, Bunnell C. Effects of a music therapy intervention on quality of life and distress in women with metastatic breast cancer. <i>J Soc Integr Oncol</i> . 2006 Summer;4(3):116-24.

Therapeutic touch (TT)	Lafreniere KD, Mutus B, Cameron S, Tannous M, Giannotti M, Abu-Zahra H, Laukkanen E. Effects of therapeutic touch on biochemical and mood indicators in women. <i>J Altern Complement Med.</i> 1999 Aug;5(4):367-70.
Therapeutic touch	Samarel N, Fawcett J, Davis MM, Ryan FM. Effects of dialogue and therapeutic touch on preoperative and postoperative experiences of breast cancer surgery: an exploratory study. <i>Oncol Nurs Forum.</i> 1998 Sep;25(8):1369-76.

Table 1. Exclusion table and reason

3.2 Study characteristics

Table 2 describes the characteristics of the studies relating to their designs, settings, numbers of participants, interventions and usual care treatments received by the patients; and according to the hospital protocol, mean age, inclusion and exclusion criteria and assessment follow-up.

Table 2. Study characteristics related to setting, number of participants, mean age, intervention and control group description, inclusion and exclusion criteria, assessed outcomes and follow-up.

Author, year	Location	No.* participants	Mean age	Description of intervention group	Description of control groups	Inclusion criteria	Exclusion criteria	Measured outcomes	Follow-up
Aghabati, 2010 [9]	Iran	90	Intervention: 38.86 Control: 43.30 Placebo: 42.70	Centering, assessment, TT administration (directing human energies, modulating human energies, changing patterns in human energy field), reassessment of the patient's energy field and	Placebo: Mimic TT treatments were provided to the placebo group by the practitioner. She performed the same movements used by the practitioner during the TT process (the duration was the same as the experimental group). However, instead of	Residents who: had a diagnosis of cancer; had a normal level of consciousness Glasgow Coma Scale, GCS=15); aged 15–65 years, and had resided in the unit for at least 5 days.	Residents who had any diseases leading to experience of pain (such as arthritis rheumatoid and osteosarcoma).	Pain using Visual Analogue Scale (VAS) and fatigue using Rhoten Fatigue Scale (RFS)	5 days

				additional treatments as needed. 30 min TT given once a day for 5 days between 10:00 a.m. and 10:30 a.m.	centering and holding the intent to help the subject, as the practitioner did in the TT intervention, here, she simply began the treatment and counted back from 100 by serial sevens during the whole treatment. Control: routine interventions in the ward.				
Tabatabaee, 2016 [10]	Iran	90	Intervention: 54 Control: 55.93	Usual care: (not specified, same) and therapeutic touch in 7	Placebo: Usual care (not specified, same) and between 10-15 minutes hands	Informed consent of participants; male patients aged 20 to 65 years;	Not reported	Pain using Brief Pain Inventory	4 week

			<p>Placebo: 53.6</p>	<p>sessions for a 4-week period between 10- 15)</p>	<p>were placed around the body as a gesture, with distance from the body, and were moved without a certain order. Control: routine interventions in the ward.</p>	<p>being conscious; having cancer related pain confirmed by physician; being diagnosed and treated at least for one year; being in remission stage; no plan for surgery as treat-ment during the intervention; and no history of using therapeutic touch.</p>			
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Demir, 2014 [11]	Turkey	18	Intervention: 38.62 Usual care: 28.70	Usual care and five distant Reiki sessions, one each night in a day for 30 min. A single Reiki practitioner located over 8 km away, who was trained in the Usui line of Reiki (Level 2) and has been practising Reiki for over 4 years. Followed the Traditional Usui Reiki protocol for distant healing. Reiki	Usual medical and nursing care	Patients over the age of 18, who were willing to be part of the study. All of them knew Turkish well, and had at least a primary school education. The study population was composed of patients with cancer at any stage and receiving any kind of chemotherapy	Not reported	Pain, stress and fatigue using VAS(0-10)	5 days
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				practitioner first undertake a name of patient and then send the healing energy to the patient.					
FitzHenry, 2009 [12]	USA	41	Intervention: 52.1 Control: 50.8	The intervention was a 45-minute session of HT therapy once a week during RT. Neither HT nor sham practitioners physically touched or spoke to the participant, since it is believed that	The intervention was a 45-minute session of sham therapy once a week during RT.	Histologically proven breast cancer surgically treated with lumpectomy or mastectomy. English-speaking adults aged 21 to 75 years old, with an Eastern Cooperative Oncology	Patients with stage IV cancer were excluded because of the poorer prognosis with this stage of cancer. In addition, patients with active psychiatric illness	Fatigue using Brief Fatigue Inventory. Quality of life using Functional Assessment of Cancer Therapy-Breast. Anxiety/depression using Hospital Anxiety and Depression Scale.	5-7 weeks

				the work on the energy field does not require physical touch.		Group (ECOG) performance status of 0, 1, or 2.	were excluded.		
Tsang, 2007 [13]	Canada	16	59	Reiki for 5 consecutive daily sessions, followed by a 1-week washout monitoring period of no treatments, then 2 additional Reiki sessions, and finally 2 weeks of no treatments.	Rested for approximately 1 hour each day for 5 consecutive days, followed by a 1-week washout monitoring period of no scheduled resting and an additional week of no treatments.	Diagnosed with cancer in stages I to IV who had recently completed chemotherapy treatment, understood English, and were currently living at home with a score of 3 or higher on the ESAS tiredness	Not reported	Fatigue using Functional Assessment of Cancer Therapy Fatigue subscale and overall Quality of life Functional Assessment of Cancer Therapy, General Version Tiredness, pain and anxiousness using ESAS.	28 days

						questionnaire			
Orsak 2014 [14]	EUA	36	Intervention: 49.13 Control: 51.73	During chemotherapy, there was a 30-minute Reiki session. To simulate a more naturalistic environment and demonstrate real-world applicability, the companion and Reiki sessions were held at a hospital's chemotherapy unit. The patient's room was in a common	For patients in the control group, data were collected but no therapeutic intervention or physical contact was administered.	Have breast cancer (stages I through III) and be seen at the Magee Women's Cancer Center and / or the Pittsburgh University Medical Center Cancer Center in the hospital ward.	Not reported	Quality of life Anguish Mood Fatigue	4 sessions

				area separated by curtains. Each Reiki session involved a series of hand positions over the body for about 3 minutes. Positions included placing hands on hands, ears, solar plexus, hips, knees and feet.					
Post-White 2003 [15]	EUA	164	Mean age was 54.7 years for both samples (range, 27-83 years).	All intervention sessions (HT) were 45 minutes in length. HT therapy was	All subjects received the control condition, which consisted of 4 weekly sessions of	patients from 2 outpatient Midwestern chemotherapy clinics who had a histologicall	Not reported	Profile of Mood States: Anxiety, Mood Disturbance, and Fatigue, Pain, Analgesic	4 weeks

				<p>provided by certified and credentialed and registered nurses. Except for an occasional substitution, the same practitioner provided all 4sessions. Intervention technique was documented through written notes of the practitioners. A customized CD of soft piano and nature music was played in the</p>	<p>standard cancer treatment alone. Subjects came to the same location as the intervention sessions, completed the same preintervention symptom assessments, and had vital signs assessed. Subjects left after the assessments were done.</p>	<p>y documented cancer diagnosis and were receiving chemotherapy with an identical repeating cycle for 2 or more remaining cycles. They also had pain, nausea, or fatigue rated 3 or more on a scale of 0 to 10 (where 10 is the worst imaginable) and were able to read and write English and</p>		
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				background, and a sign was posted outside the closed door to prevent interruptions. Sessions started with a 3-minute scripted centering message, with messages to focus on breathing and letting go of extraneous thoughts. followed the protocol developed by Healing Touch International Levels 1-3,		give informed consent.			
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				using both touch and nontouch techniques. Energy techniques included centering, unruffling, magnetic unruffling, full-body connection, mind clearing, chelation, and lymphatic drain to modulate the energy field					
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<p>Catlin 2011 [16]</p>	<p>EUA</p>	<p>189</p>	<p>The typical participant in any of the groups was aged 69–78 years (76%)</p>	<p>Reiki: was administered by a trained and experienced Reiki therapist who delivered the healing energy to the patient as is customary in biofield therapies. The intervention lasted 20 minutes and consisted of the provider treating the patient’s body, emotions, mind, and spirit by following</p>	<p>Sham Reiki placebo: The sham Reiki placebo provider pretended to perform a Reiki session by moving her hands on the patient’s body in a specific order for a 20-minute period following strictly operationalized measures. The sham Reiki therapist was chosen in part because of her disbelief in biofield energy transfer. In an effort to prevent any</p>	<p>Potential participants were receiving outpatient chemotherapy in an infusion clinic located in northern California. Inclusion requirements were that participants had to be aged 18 years or older and able to speak or read enough English to fill out two assessment tools, a</p>	<p>Not reported</p>	<p>In Comfort, Well-Being (Physical well-being Mental well-being Physical comfort Mental comfort)</p>	<p>1 session</p>
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				<p>specified hand positions on a completely clothed body to cover all seven main chakras and all major organs beginning at the head and moving down. Six major energy centers were administered to, including the crown, the brow, the throat, the heart, the solar plexus, and the sacrum. During the Reiki therapy</p>	<p>possible healing energy from coming through the sham therapist, the sham therapist was asked to do math problems or create a shopping list in her head.</p>	<p>demographic survey, and the consent form.</p>			
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				session, the Reiki therapist managed the energy to treat “dis-ease” and improve physical, mental, emotional, and spiritual well-being					
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3.3 Risk-of-bias assessment

Figure 3 describes the risk-of-bias assessment for RCTs. In the random sequence generation domain, one study was considered low risk (FITZHENRY ET AL., 2014), one high risk study (CATLIN & TAYLOR-FORD 2011) and six studies were considered uncertain because they did not report this process in the study POST-WHITE et al.,2003; TSANG, CARLSON & OLSON,2007; AGHABATI, MOHAMMADI & POUR 2010; DEMIR ET AL., 2015; ORSAK ET AL., 2015; TABATABAEE ET AL., 2016). In the allocation concealment domain, two studies were considered low risk (CATLIN & TAYLOR-FORD 2011; FITZHENRY ET AL., 2014), one high risk study (ORSAK ET AL., 2015) and five studies were considered uncertain because they did not report this process (POST-WHITE et al.,2003; TSANG, CARLSON & OLSON,2007; AGHABATI, MOHAMMADI & POUR 2010; DEMIR ET AL., 2015; TABATABAEE ET AL., 2016).

In the blinding domain of participants and professionals, three studies were considered low risk (CATLIN & TAYLOR-FORD 2011; FITZHENRY ET AL., 2014;TABATABAEE ET AL., 2016), four studies high risk (TSANG, CARLSON & OLSON,2007;CATLIN & TAYLOR-FORD 2011; FITZHENRY ET AL., 2014; ORSAK ET AL., 2015;TABATABAEE ET AL., 2016) and one study was considered uncertain (CATLIN & TAYLOR-FORD 2011). Blinding of outcome evaluators has not been reported in any study (POST-WHITE ET AL.,2003;TSANG, CARLSON & OLSON,2007; AGHABATI, MOHAMMADI & POUR 2010; CATLIN & TAYLOR-FORD 2011; FITZHENRY ET AL., 2014; DEMIR ET AL., 2015; ORSAK ET AL., 2015; TABATABAEE ET AL., 2016).

Finally the domains incomplete outcomes, report of selective outcome and other sources of bias were considered low risk in all studies included in the analysis (POST-WHITE ET AL.,2003;TSANG, CARLSON & OLSON,2007; AGHABATI, MOHAMMADI & POUR 2010; CATLIN & TAYLOR-FORD 2011; FITZHENRY ET AL., 2014; DEMIR ET AL., 2015; ORSAK ET AL., 2015; TABATABAEE ET AL., 2016).

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Aghabati 2008	?	?	-	?	+	+	+
Catlin 2011	-	+	+	?	+	+	+
Demir 2015	?	?	-	?	+	+	+
Fitz Henry 2015	+	+	+	?	+	+	+
Orsak 2015	?	-	-	?	+	+	+
Post-White 2003	?	?	?	?	+	+	+
Tabatabaee 2016	?	?	+	?	+	+	+
Tsang 2007	?	?	-	?	+	+	+

Fig. 3 Assessment of bias risk of studies included.

3.4 Meta-analyses

Fatigue

Results from 6 RCTs indicated that there is no statistically significant: mean difference (MD) = -0.24; 95% confidence interval (CI): -2.15 to 1.67; I2 = 98% (Fig 4).

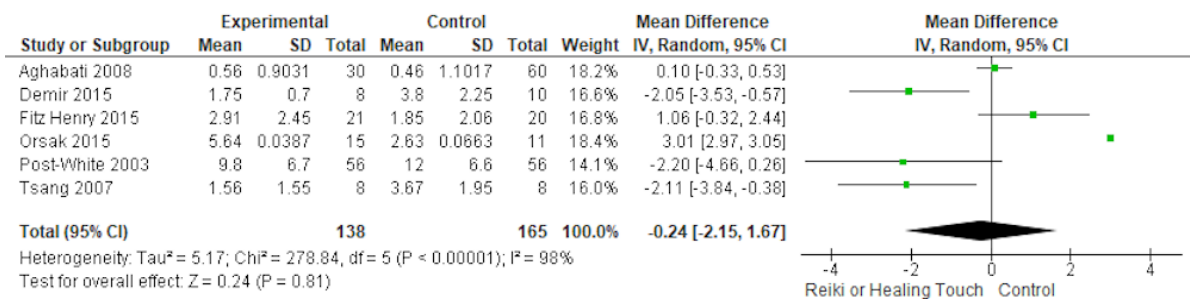


Fig. 4 Meta-analysis on mean fatigue

Pain

The results of 4 randomized clinical trials indicated that there is no statistically significant difference between the groups: MD = -1.01; 95% CI: -2.72 to 0.70; I2 = 95% (Fig 5).

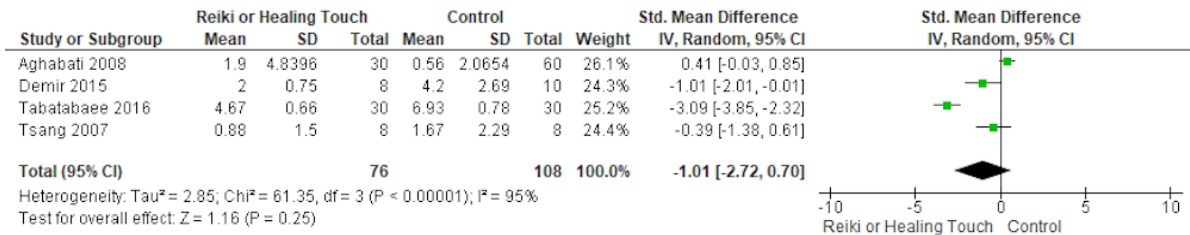


Fig. 5 Meta-analysis on mean pain

Anxiety

Results from 5 RCTs indicated a statistically significant difference favoring reiki or healing touch over usual care: MD = -2.09; 95% CI: -3.00 to -1.19; I2 = 51% (Fig 6).

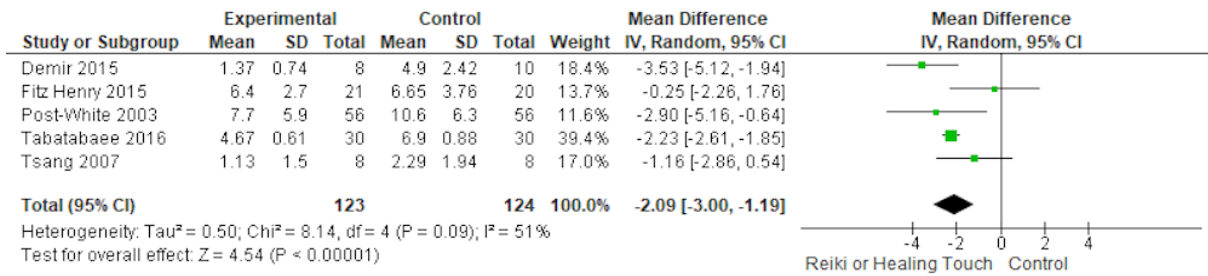


Fig. 6 Meta-analysis on mean anxiety

Quality of life

The results of 3 randomized clinical trials indicated a statistically significant difference favoring reiki or healing touch over usual care: MD = -5.97; 95% CI: -10.70 to -1.25; I2 = 97% (Fig 7).

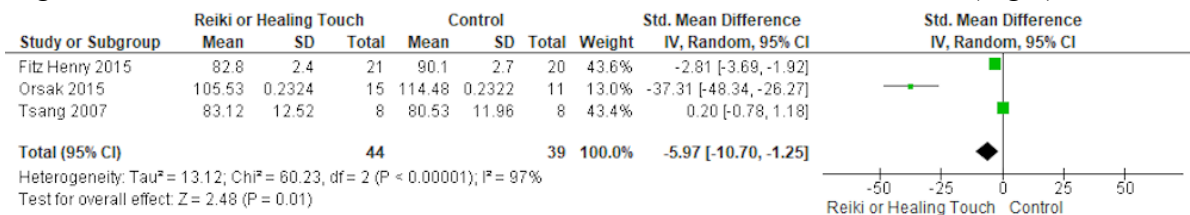


Fig. 7 Meta-analysis on mean quality of life

4. Discussion

4.1 Evidence summary

The analyzes showed that there was a statistically significant for anxiety control (MD = -2.09; 95% CI: -3.00 to -1.19; I2 = 51%) and increased quality of life (MD = -5.97; 95% CI: -10.70 to -1.25; I2 = 97%).

This evidence should be interpreted with extreme caution, as there was great heterogeneity between

studies. For the other outcomes analyzed, how pain and fatigue no statistically significant difference was found.

The World Health Organization (WHO) defines Quality of Life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (WHO,1978). It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to the environment (WHO,1978; BENOR, 2001).

Vital energy is a millenary practice, therefore, carrying different names, such as chi (China), prana (India), axé (Africa). Among these therapies, there is Reiki, a technique of imposing hands in which vital energy is channelled onto patient's body to re-establish balance in their body, spirit and soul (TSANG, CARLSON & OLSON,2007; AGHABATI, MOHAMMADI & POUR 2010).

The exercise of channelling is performed through symbols and sacred sounds; they work as keys that open up the channel. The application is carried out with manual touches on to the body of the patient. Yet, such energy is not quantified by physics; nevertheless, reiki practitioners believe that it can restore health (TSANG, CARLSON & OLSON,2007; AGHABATI, MOHAMMADI & POUR 2010).

In 2016, a study carried out by the Brazilian Ministry of Health revealed that Reiki was the most applied technique of all complementary and integrative practices in the national health system, due to the non-invasive kind; non-contraindication does not require physical effort; and promotes an easy and simple practice for energy balance (TELESI, 2016).

In 2006, Brazilian Health Ministry created the Política Nacional de Práticas Integrativas e Complementares (PNPIC) under the Sistema Único de Saúde (SUS) on Integrative and Complementary Practices; therefore, homeopathy; acupuncture and traditional Chinese medicine; medicinal plants and phytotherapy; and anthroposophic medicine began to be part SUS treatments (TELESI, 2016) . In 2016, this policy extended to other treatments, such as social therapy, circle dance, yoga, massage and auricular therapy. In addition, art and music therapy, meditation, naturopathy, osteopathy, chiropractic and Reiki were just introduced in January 13, 2017 (WHO,1978; BENOR, 2001).

4.2 Limitations

One of the study's major limitations was very small number of studies considering reiki or healing touch in patients undergoing chemotherapy. Therefore, there is still a need for high-quality papers on this issue, bias risk analysis showed that the studies have a great methodological bias in their elaboration, especially in the random sequence generation and in the blinding of evaluators of outcome.

In addition to the low number of studies on the subject, the number of participants included in each study was low, evidencing the need to elaborate more studies with larger populations. There was high heterogeneity among the studies, this factor may have occurred due to the design of the studies, being able to be a source of clinical heterogeneity.

Another limitation of this study may be that it did not include observational studies, but this fact was to find better evidence available in the literature.

5. Conclusions

5.1 Implications for practice

Evidence has suggested that reiki or healing touch is effective in reducing anxiety, increased quality of life for patients undergoing chemotherapy however and the bias risk analysis of studies has shown important flaws and should be used very carefully.

5.2 Implications for future research

The current systematic review reinforces the importance of the need to carry out new trials on the application of complementary therapies, such as reiki, alongside conventional treatments. These complementary therapies enrich the public health system for its low cost and absence of side effects and proved to be effective on the reduction of anxiety and increased quality of life in this study.

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