ACUPUNCTURE FOR PAIN CONTROL AMONG BREAST CANCER PATIENTS: AN INTEGRATIVE LITERATURE REVIEW

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ABSTRACT

Introduction: Pain is a frequent symptom among women with breast cancer and acupuncture is a widely used intervention to control the symptoms of the disease and minimize the impact of the adverse effects of cancer treatment. However, the contexts of use and their effectiveness need to be better explored. Objective: To describe the studies that used acupuncture as an intervention for pain control in patients with breast cancer. Method: Integrative literature review. The searches were carried out using the descriptors breast cancer, pain, and acupuncture in the Scientific Electronic Library (SCIELO), National Library of Medicine (PubMed) and Latin American and Caribbean Literature on Health Sciences (LILACS) databases through the Virtual Health Library (VHL) and in the Cumulative Index to Nursing and Allied Health Literature (CINAHL). SCOPUS and Web of Science. To report the integrative review and systematize the inclusion process, the criteria of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses were used. Results: The final sample consisted of 17 studies, grouped into four thematic categories: arthralgia related to aromatase inhibitors (41.2%; n=7); multiple symptoms/complications related to treatment (29.4%; n=5); pain and chronic pain (17.6%; n=3) and (11.8%; n=2) peripheral neuropathy and chemotherapy. The studies were mostly published by Asian countries (64.7%; n=11), mainly in the years 2020 (29.4%) and (23.5%) 2021, by journals related to oncology and complementary/integrative practices. Systematic reviews with meta-analysis accounted for the majority of studies (52.9%; n=9), followed by Randomized Clinical Trials (n=3) and (n=2) pilot studies. Among the instruments for assessing pain, the BPI stood out, used in 70.6%; n=12) of the cases. Most studies (52.9%) used systemic acupuncture alone, 29.4% used systemic acupuncture and auriculotherapy, and two studies (11.8%) used systemic acupuncture and acupressure. In most studies (76.5%; n=13), acupuncture decreased pain (intensity and/or impact and/or mean pain) among women with breast cancer. Conclusion: Although there is no consensus, in most studies, acupuncture decreased pain (intensity and/or impact and/or mean pain and/or worse pain) among patients with breast cancer.

Keywords: Acupuncture Analgesia. Acupuncture. Auricular acupuncture. Electroacupuncture. Breast Neoplasms.

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INTRODUCTION

Breast cancer control is a priority on the Brazilian health agenda (NOVAES *et al*., 2017) and, despite being considered a cancer with a good prognosis, when detected and treated early, mortality rates remain high, since most diagnoses are made in advanced stages of the disease (VALLIM *et al*, 2019), characterizing breast cancer as a serious public health problem (NOVAES et al., 2017; VALLIM *et al*., 2019). It is the first cause of cancer death in the Brazilian female population and the second most prevalent type of cancer among women, with an estimated 73,610 new cases for the 2023-2025 triennium (INCA, 2023).

Among women with breast cancer, pain is a frequent symptom, its prevalence and intensity varies throughout the evolution of the disease, being moderate or intense in 30% of individuals during treatment and between 60% and 90% of those in an advanced stage of the disease (MOURA; GONÇALVES, 2020). It is described as imprecise, painful, frightening or as an unbearable sensation, with episodes of intense sensations, accompanied by difficulties sleeping, irritability, depression, suffering, isolation, hopelessness and helplessness, and its adequate control is a challenge for health services and for the multiprofessional team (RUELA *et al*, 2018). When not properly controlled, pain results in undesirable effects and, despite having received more attention in recent years and being considered a worldwide medical emergency, about 40% to 50% of cancer pain cases still have inadequate relief (RUELA *et al*., 2018).

Pain control can be effective through pharmacological and non-pharmacological measures. Acupuncture is a technique of Traditional Chinese Medicine (TCM) (TAFFAREL; FREITAS, 2009), implemented in Brazil in 1981 and inserted in the Unified Health System (SUS). It consists of inserting needles into specific anatomical points on the body, with the aim of producing a therapeutic or analgesic effect (MENDES *et al*., 2019). It stimulates the sensory fibers of the peripheral nervous system (PNS), triggering an electrical transmission in neurons, which when it reaches the central nervous system (CNS) causes the release of substances such as: endorphins, cortisol, dopamine, serotonin (VALLIM *et al*., 2019). Acupuncture points, when in conditions of imbalance, show higher concentrations of substance P, compared to placebo points, lowering the pain threshold and making these points more sensitive when touched (AZEVEDO *et al*., 2021).

Health services have the possibility of incorporating integrative and complementary health practices (AMADO *et al*., 2017), especially when conventional treatments become limited. The National Policy on Integrative and Complementary Practices (PNPIC) brought guidelines for Traditional Chinese Medicine/Acupuncture, Homeopathy, Medicinal Plants

and Phytotherapy, among others (AMADO *et al*., 2017; NOVAES *et al*., 2017; MENDES *et al*., 2019; VALLIM *et al*., 2019). In this context, new ways of learning and practicing health (JÚNIOR, 2016) in line with the increase in demand resulting from chronic diseases and the costs of health services, dissatisfaction with existing health services, and the resurgence of interest in holistic and preventive care for diseases and treatments that offer quality of life when a cure is not possible, the demand for practices such as acupuncture, homeopathy and phytotherapy in the health system increased from the year 2000 onwards (2018 *apud* TESSER; BROOK; AFONSO, 2020).

Studies evaluating the effect of acupuncture in the oncological context are carried out in the management of symptoms, varying with the type of tumor. Studies on the use of acupuncture in breast cancer are carried out with the aim of controlling the symptoms of the disease and minimizing the impact of the adverse effects of cancer treatment, presenting promising results (NOVAES *et al*., 2017). In this context, PICS are used in association with chemotherapy, surgical treatment, and in clinical cases with a worse prognosis, seeking benefits for patients (MENDES *et al*., 2019).

However, despite many studies showing that acupuncture associated with conventional cancer treatment is effective and well accepted by cancer patients, including patients diagnosed with breast cancer, the contexts of use and the effect of the intervention need to be further explored.

In view of the above, the objective of this integrative review is to describe the characteristics of studies that used acupuncture as an intervention for pain control, as well as the context of use and the effect of the intervention in patients with breast cancer.

METHODOLOGY

It is an integrative review carried out in five stages: definition of the guiding question; elaboration of the inclusion and exclusion criteria of the articles to carry out the search in the databases; critical analysis; presentation of the results and discussion (SOUZA, SILVA, CARVALHO, 2010). The investigation was guided by the question: "What has been produced in relation to the use of acupuncture for pain control in women with breast cancer?"

Articles that met the inclusion criteria were selected: (a) full articles, theses or dissertations, and experience reports; (b) studies published in Portuguese, English or Spanish; (c) with any methodological design, published between 2017 and 2022. Abstracts published in annals of events, editorials, and those not available for access to the full text were excluded.

The searches were carried out between March and May 2022, using the Health Sciences Descriptors (DeCS), *Medical Subject Headings* (MeSH), *Cinahl Heading,* and *Emtree of Embase* by two researchers independently.

The bibliographic survey was carried out with the keywords *breast cancer*, *pain*, and *acupuncture* in the *Scientific Electronic Library* (SCIELO), *National Library of Medicine* (PubMed) and *Latin American and Caribbean Literature on Health Sciences* (LILACS) databases through the Virtual Health Library (VHL) and in the *Cumulative Index to Nursing and Allied Health Literature* (CINAHL), SCOPUS and *Web of Science*.

Along with the descriptors, the terms AND, OR and NOT were used to compose the search keys to be used for searches in the databases.

After the duplicate articles were excluded, 59 potentially eligible articles were identified (Table 1).

Initially, the words contained in the titles, abstracts and descriptors were analyzed. The selected studies that corresponded to the guiding question of this review were read in full and their references were analyzed for additional studies.

After reading the material by two independent evaluators, articles that did not answer the study question and did not meet the eligibility criteria were excluded (n=42; Table 1). Divergences were discussed among the evaluators and consensus was reached.

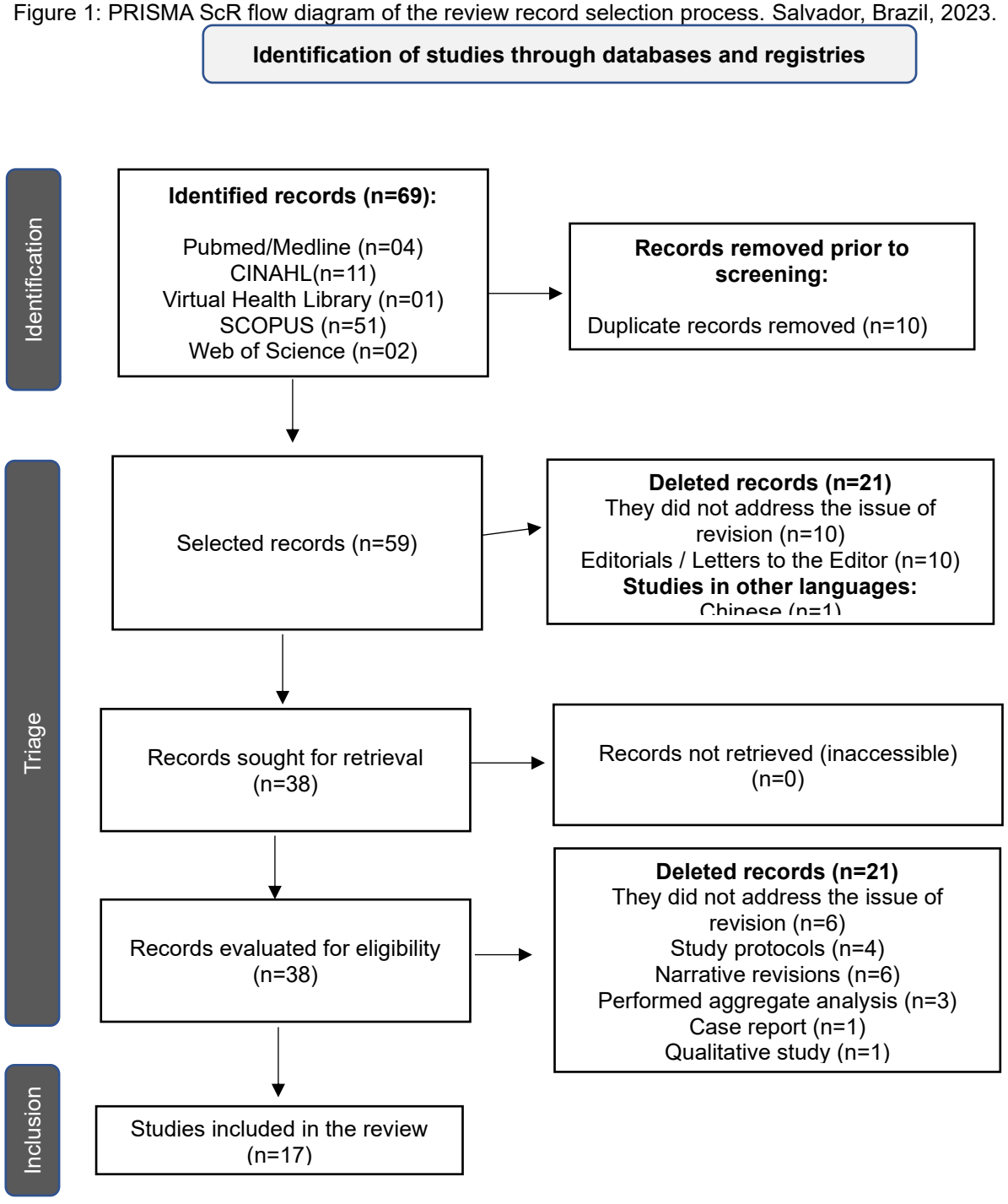
The criteria of the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) were used to report the integrative review and systematize the process of inclusion of studies (Figure 1) (SHAMSEER *et al*, 2015).

Table 1. Distribution of studies, according to the database. Salvador (BA), Brazil, 2023.

Database	Retrieved studies (%)	Repeat studies (%)	Mutually exclusive studies (%)	Excluded studies (%)	Selected studies (%)
BVS	1(1,4)	1 (10,0)	0 (0,0)	0 (0,0)	0 (0,0)
Scopus	51 (73,9)	1 (10,0)	50 (84,7)	35 (83,3)	15 (88,2)
Web of Science	2 (2,9)	2 (20,0)	0 (0,0)	0 (0,0)	0 (0,0)
Cinahl	11 (15,9)	4 (40,0)	7 (11,9)	5 (11,9)	2 (11,8)
Medline	4 (5,8)	2 (20,0)	2 (3,4)	2 (4,8)	0 (0,0)
TOTAL	69 (100,0)	10 (100,0)	59 (100,0)	42 (100,0)	17 (100,0)

Source: authors (2023).

Figure 1: PRISMA ScR flow diagram of the review record selection process. Salvador, Brazil, 2023.



Detailed and standardized information was extracted by the *Joanna Briggs Institute* (JBI), such as: title, author and year, journal and place, year of publication, method and number of patients included, as well as the instrument for pain assessment and the effect of acupuncture for analgesia. The information extracted was summarized and is presented in Tables 1, 2, 3 and 4.

RESULTS

The final sample consisted of 17 studies, grouped into four thematic categories: (41.2%; n=7) arthralgia related to aromatase inhibitors (Chart 1); (29.4%; n=5) multiple symptoms/complications related to treatment (Chart 2); (17.6%; n=3) pain and chronic pain (Chart 3) and (11.8%; n=2) peripheral neuropathy and chemotherapy (Chart 4).

The studies were mostly published by Asian countries (64.7%; n=11), especially China (35.3%; n=6), Korea (23.5%; n=4) and (5.9%; n=1) Iran. Four studies (23.5%) were published by the United States, one by Iceland and one by Australia. It was observed that the publications were concentrated in the years 2020 (29.4%; n=5) and 2021 (23.5%; n=4). In 2018 there were three publications, in 2017 and 2019 two publications per year and one study was published in 2022. Studies published by journals related to oncology and complementary/integrative practices stood out, with five studies (29.4%) each, as well as systematic reviews with meta-analysis, which represented the majority of studies (52.9%; n=9), followed by Randomized Clinical Trials (RCTs) (n=3) and (n=2) by pilot studies. The remaining studies were a systematic review, a retrospective cross-sectional study, and a prospective longitudinal study.

Among the studies that used a single instrument to assess pain (52.9%; n=9), the BPI stood out, used in 66.7% of the cases. The Visual Analogue Scale (VAS) and the NPSI were used separately in two and one study, respectively. Seven studies (41.2%) combined instruments for pain assessment, and in one study the instrument used was not described. Most studies (52.9%; n=9) used systemic acupuncture alone, 29.4% (n=5) used systemic acupuncture and auriculotherapy, two studies (11.8%) used systemic acupuncture and acupressure, and one study did not describe the type of acupuncture used. In most studies (76.5%; n=13), acupuncture decreased pain (intensity and/or impact and/or mean pain) among women with breast cancer. One study reported moderate improvement of the intervention, one study concluded that acupuncture may or may not decrease pain, one study observed no difference between acupuncture and massage in reducing pain, and one study did not recommend the use of acupuncture for pain control.

AROMATASE INHIBITOR-RELATED ARTHRALGIA

Acupuncture decreased pain in most studies evaluating the effect of the intervention on arthralgia related to the use of aromatase inhibitors. However, one study concluded that the evidence is not strong enough to recommend it for this purpose (Exhibit 1).

MULTIPLE TREATMENT-RELATED SYMPTOMS/COMPLICATIONS

The studies grouped in the multiple symptoms/complications related to the treatment category showed a decrease in pain intensity and interference, with a variation in magnitude depending on the instrument used. One study showed inconclusive results, concluding that manual acupuncture and auriculotherapy may or may not relieve pain and improve the function of the affected region in women with breast cancer. While two studies with manual acupuncture and electroacupuncture showed decreases in pain intensity. Massage combined with acupuncture did not significantly influence pain intensity (Chart 2).

Table 1. Characterization of studies related to arthralgia related to aromatase inhibitors. Salvador, Brazil, 2023.

Title	Author (Year)	Newspaper (Country)	Study Type (Sample Size)	Instrument(s) used for pain assessment	Type of acupuncture	Effect of acupuncture on pain
Acupuncture for arthralgia induced by aromatase inhibitors in patients with breast cancer: a systematic review and meta-analysis	Liu et al (2021)	Integr Cancer Ther (China)	Systematic Review and Meta-Analysis (7 RCTs/n=603)	BPI	Auriculotherapy and systemic	Decreases (impact, intensity and the worst pain)
Acupuncture for hormone therapy-related side effects in breast cancer patients: a GRADE-assessed systematic review and updated meta-analysis	Yuanqing et al. (2020)	Integr Cancer Ther (China)	Systematic Review and Meta-Analysis (Pain = 5 RCTs/n=319)	WOMAC; BPI; EVN;	Auriculotherapy and systemic	Moderate improvement; Low quality of evidence (SMD = -1.05; 95% CI = -1.89 to -0.21; P = 0.01)
Genetic predictors of response to acupuncture for aromatase inhibitor-associated arthralgia among breast cancer survivors	Genovese et al. (2019)	Pain Med (Iceland)	Retrospective Cross-Sectional Study (n=38)	BPI	Systemic	60.5% (30% reduction in mean pain at the end of treatment)
Effect of Acupuncture vs Sham Acupuncture or Waitlist Control on Joint Pain Related to Aromatase Inhibitors Among Women With Early-Stage Breast Cancer: A Randomized Clinical Trial	Hershman et al. (2018)	JAMA (USA)	Randomized Clinical Trial (True acupuncture = 110; Sham acupuncture=59; Control group=57)	BPI-WP	Systemic	Statistically significant reduction in pain (2.05 points) at 6 weeks
Therapeutic options for aromatase inhibitor-associated arthralgia in breast cancer survivors: a systematic review of systematic reviews, evidence mapping, and network meta-analysis	Kim et al. (2018)	Maturitas (Korea)	Systematic Review and Meta-Analysis (6 systematic reviews)	BPI	Not Described	Significantly improved pain intensity scores (mean difference [MD] -2.00); Low evidence

Management of aromatase inhibitor induced musculoskeletal symptoms in postmenopausal early breast cancer: a systematic review and meta-analysis	Roberts et al. (2017)	Crit Rev Oncol Hematol (Australia)	Systematic Review and Meta-Analysis (6 acupuncture-related studies / 221 patients)	BPI-SF	Systemic	The evidence is not strong enough to recommend it
Effect of acupuncture on aromatase inhibitor-induced arthralgia in patients with breast cancer : A meta-analysis of randomized controlled trials	Chen et al. (2017)	Breast (China)	Systematic Review and Meta-Analysis (5 RCTs / 181 patients)	BPI e WOMAC	Auriculotherapy and systemic	Significant decrease in worst pain score by BPI and pain score by WOMAC after 6-8 weeks of treatment

Source: Authors (2023).

Table 2. Characterization of studies related to multiple symptoms/complications related to treatment. Salvador, Brazil, 2023.

Title	Author (Year)	Newspaper (Country)	Study Type (Sample Size)	Instrument(s) used for pain assessment	Type of acupuncture	Effect of acupuncture on pain
Acupuncture for symptoms management in Korean breast cancer survivors: a prospective pilot study	Kim et al. (2019)	Acupunct Med (Korea)	Prospective pilot study (n=8)	BPI-SF; NRS; WOMAC	Auriculotherapy and systemic	Decreased pain intensity and interference; The individual items (pain, stiffness and physical function) on the WOMAC scale improved little (score 59 to 56)
Acupuncture as an adjuvant therapy for management of treatment-related symptoms in breast cancer Patients	Jang et al. (2020)	Medicine (Korea)	Systematic Review and Meta-Analysis (19 RCTs / 4 Pain-related)	WOMAC; BPI-SF; M-SACRAH	Auriculotherapy and systemic	Can or not relieve pain and improve the function of the affected region.
Acupuncture improves multiple treatment- related symptoms in breast câncer survivors: a systematic review and meta-analysis	Li et al. (2021)	J Altern Complement Med (USA)	Systematic Review and Meta-Analysis (26 RCTs/7 related to pain (arthralgia; neuropathy)	Not described	Systemic	Significantly decreased pain intensity
Effects of acupuncture and moxibustion on breast cancer-related lymphedema: a systematic review and meta-analysis of randomized controlled trials	Gao et al. (2021)	Integr Cancer Ther (China)	Systematic Review and Meta-Analysis (14 RCTs / 10 Acupuncture-related)	VAS	Systemic	Decreased the intensity

Massage compared with massage plus acupuncture for breast cancer patients undergoing reconstructive surgery (cirurgia)	Dilaveri et al. (2020)	J Altern Complement Med (USA).	Prospective longitudinal study (n=42/n=21: received massage and acupuncture)	VAS	Systemic	No significant difference was observed between the groups

Source: Authors (2023).

CHRONIC PAIN AND SORENESS

In studies related to pain/chronic pain, positive effects of acupuncture (acupressure, systemic acupuncture, electroacupuncture) were observed, such as a reduction in intensity and a lower incidence of chronic pain. The positive effect of acupuncture for postoperative pain control is highlighted. However, the effect of acupressure on reducing pain intensity was not statistically significant (Chart 3).

Table 3. Characterization of studies related to pain and chronic pain. Salvador, Brazil, 2023.

Title	Author (Year)	Newspaper (Country)	Study Type (Sample Size)	Instrument(s) used for pain assessment	Type of acupuncture	Effect of acupuncture on pain
Efficacy of physical therapy interventions on quality of life and upper quadrant pain severity in women with post-mastectomy pain syndrome: a systematic review and meta-analysis	Kannan et al (2022)	Qual Life Res (China)	Systematic Review and Meta-Analysis – RSM (18 RCTs)	NPRS/ BPI-SF	Systemic/Acupressure	Significant decrease in pain intensity; The meta-analysis showed no significant effect of acupressure on pain intensity
Transcutaneous electrical acupoint stimulation before surgery reduces chronic pain after mastectomy: a randomized clinical trial	Lu et al. (2021)	J Clin Anesth (China)	Randomized Clinical Trial – RCT (Electroacupuncture with isolated suture=198; Electroacupuncture with combined point = 190; Control group=188)	NRS and DN4	Systemic	Combined electroacupuncture of stitches before surgery was associated with reduced pain score (3 months) and lower incidence of chronic pain (6 months) after surgery

Effect of complementary and alternative medicine interventions on cancer related pain among breast cancer patients: a systematic review	Behzadmehr et al (2020)	Complement Ther Med (Iran)	Systematic review (n=46 studies / n=3685 patients)	BPI-SF / VAS/NRS	Systemic/Acupressure	Decreased

Source: Authors (2023).

PERIPHERAL NEUROPATHY

Systemic acupuncture decreased pain related to peripheral neuropathy associated with the use of taxanes (Chart 4).

Table 4. Characterization of studies related to peripheral neuropathy. Salvador, Brazil, 2023.

Title	Author (Year)	Newspaper (Country)	Study Type (Sample Size)	Instrument used for pain assessment	Type of acupuncture	Effect of acupuncture on pain
Acupuncture for chemotherapy-induced peripheral neuropathy in breast cancer survivors:randomized controlled pilot trial	Lu et al. (2020)	Oncologist (EUA)	Randomized Clinical Trial – RCT (n=40)	BPI-SF	Systemic	Decreased
Acupuncture for the treatment of Taxane-induced peripheral neuropathy in breast cancer patients: a pilot trial	Jeong et al. (2018)	Evid Based Complement Alternat Med (Coréia)	Pilot Study (n=10)	NPSI	Systemic	Decreased

Source: Authors (2023).

DISCUSSION

The present study evaluated the influence of acupuncture on pain control among patients with breast cancer.

The predominance of publications by Asian countries was expected since acupuncture and its derivations date back to cosmological texts, legacies of Taoism, taking into account the thinkers and philosophers of the Eastern world, where the 'primordial breath', called Qi, pre-existent to the formation of Heaven and Earth, is spoken of. The essence of Eastern philosophy was the foundation of the so-called traditional Eastern medicines, especially Chinese (JÚNIOR, 2016). In this sense, the absence of studies

carried out in Brazil and Latin American countries is highlighted, reinforcing the need for greater investments for research in the area of integrative practices.

The predominance of systematic reviews with meta-analysis drew attention and is a particularly important result of the present study. This type of study consists of combining results from different studies and thus producing estimates, which summarize the whole. In order to consider that the result of a meta-analysis has applied meaning, the studies that make up its data must be the result of a systematic review, which consists of a set of rules to identify studies on a given issue and thus select which of them will be included (ROEVER, 2016). This fact highlights the search for robust evidence on the influence of acupuncture on pain control among cancer patients.

The instruments used to assess pain included the BPI (Brief Pain Inventory), the ESAS (Edmonton Symptom Assessment), the Visual Numeric/Analog Scale (VAS/EVN), the Patient Neurotoxicity Questionnaire (PNQ), Neuropathic Pain Symptom Inventory (NPSI), Modified Douleur Neuropathique (DN), Analysis of covariance (ANCOVA), Guideline Development Tool software (GRADEpro GDT), Well-being QoI (MYCAW) and Related symptoms (BC).

The BPI measures pain severity and its interface, assessing pain location, pain intensity, comparison between extremes of pain intensity, and relief brought by the treatment being researched (MAO et al., 2017). The ESAS scores for symptoms such as pain, fatigue, nausea, depression, anxiety, loss of appetite, drowsiness, shortness of breath, sleepiness, and decreased well-being (NARAYANAN *et al*., 2021, RAZ *et al*., 2020, GRANT *et al*., 2021).

The VAS scale evaluates pain intensity and allows the analysis of the individual's evolution during treatment and at each visit, in a reliable way (CASASSOLA *et al*., 2020, GENOVESSE; MAO, 2019). The PNQ aims to detect sensory nerve deficit and interference of neuropathy symptoms in activities of daily living (LU *et al*., 2020). The NPSI is a self-administered questionnaire that evaluates the different symptoms of neuropathic pain, where description 1 means spontaneous burning pain, 2 pain when pressing, characteristic of paroxysmal pain, and 3 evoked pain, related to paresthesia/dysesthesia. The assessment is valid for 24 hours and quantified on a scale ranging from 0 (no pain) to 10 (unimaginable severe pain) (JEONG *et al*., 2018). The DN instrument evaluates aspects related to pain intensity, neuropathic pain components, and the quality of recovery (LU *et al*., 2021). The GRADEpro GDT (*Guideline Development Tool software*) instrument evaluated variables such as hot flashes, fatigue, pain, stiffness, and physical well-being (YUANQING et al., 2020). The MYCAW instrument assessed quality of life, pain, fatigue,

hot flashes, neuropathic pain, nausea/vomiting (STOCKIGT 2021, KIM; KANG; LEE, 2018, NARAYANAN et al., 2021, GRANT *et al*., 2021). The BC (*related symptoms*) instrument assessed pain intensity, quality of life, sleep, emotional state, lymphedema, neuropathic pain, cognitive impairment, and gastrointestinal symptoms (JANG *et al*., 2020).

Most studies used systemic acupuncture and the techniques used ranged from manual stimulation, electroacupuncture, stimulation of acupuncture points with infrared laser light and the use of associated moxitherapy.

Acupuncture is the set of theoretical-empirical knowledge of Chinese medicine that aims to cure diseases through the application of needles, seeds, moxas, and other techniques (WEN 2006 *apud* COSTA *et al*. 2017; VALLIM *et al*., 2019). Systemic acupuncture through manual stimulation consists of introducing the needle into the acupuncture point and manually stimulating the needle to the sensation of the deqi, which describes the "sensation of the needle" during the proper stimulation of an acupuncture point (FOCKS; MARZ, 2018). Electroacupuncture, on the other hand, consists of inserting the needle into the acupuncture point and applying a mini-stimulation of electric current via needles (ZHANG *et al*., 2021). The electric current passes along the needles and promotes a great electrical stimulus (GREENLEE *et al*., 2018).

Auriculotherapy was also used in some studies. Originating in Traditional Chinese Medicine (TCM), it is described about 2,500 years ago and seeks harmony and balance in the body through stimuli performed at specific points of the pinna that cause direct reflexes on the central nervous system (RUELA *et al*., 2018; AZEVEDO *et al*., 2021). This technique acquired scientific support through the first publication in France in the mid-50s. The basis of this method aims to promote analgesia and diagnosis by stimulating the pinna, obtaining homeostasis and thus regulating energy within the meridians (AZEVEDO *et al*., 2021). Auriculotherapy promotes stimulation for the production of the release of endorphins, cortisol, dopamine, serotonin and noradrenaline, which can cause well-being (VALLIM, 2019). It has shown satisfactory results in the treatment of cancer pain (RUELA *et al*., 2019; VALLIM *et al*., 2019). It is a complementary treatment that does not use drugs and offers minimal risk to the patient (RUELA *et al*., 2018). It improves quality of life, controls nausea, vomiting, and constipation in cancer patients, and controls pain in certain clinical conditions (AZEVEDO *et al*., 2021). Auriculotherapy with needles is indicated in clinical practice, controlling common signs and symptoms of cancer patients who have received cancer treatment (VALLIM *et al*., 2019). Auricular therapy involves an approach that seeks to stimulate the natural mechanisms of health recovery, with an emphasis on welcoming listening, the development of the therapeutic bond, and the integration of the human being

with the environment and society, which contributes positively to the effect of the intervention (AZEVEDO *et al*., 2021). The stimulus exerted on the pinna activates energy channels throughout the body (AZEVEDO *et al*., 2021).

In most studies acupuncture decreases pain (intensity, impact, average pain, worst pain) (LU *et al*., 2020, JEONG *et al*. 2018, BEHZADMEHR *et al*. 2020, KANNAN *et al*. 2020, LIU *et al*., 2021, HERSMAN *et al*., 2018, CHEN *et al*., 2017, KIM *et al*., 2018, LIU *et al*., 2021, KIM *et al*., 2019, LI *et al*. 2021, GAO *et al*., 2021, LU *et al*., 2021, GENOVESE *et al*., 2019), but there were studies where the influence of the intervention on this outcome was not significant (DILAVERI *et al*., 2020, YUANQING *et al*. 2020, JANG *et al*. 2020) and one study did not recommend the use of acupuncture for pain management in women with breast cancer (ROBERTS *et al*., 2017).

In this sense, it is important to highlight that the heterogeneity between the studies regarding the technique applied in the intervention, the instrument used to measure pain, and the acupuncturist's experience, may influence the results. Still The evaluation of pain and consequently of the influence of any intervention on the symptom is subjective.

To facilitate the interpretation of the results, the studies were grouped into four categories, with emphasis on arthralgia related to aromatase inhibitors and the multiple symptoms/complications related to cancer treatment. The other categories were chronic pain and pain, and chemotherapy-related peripheral neuropathy.

Aromatase inhibitors consist of drugs that inhibit estrogen production and are associated with arthralgia and joint pain, which are symptoms that affect half of breast cancer survivors, being one of the main adverse effects related to the use of this class of drugs (GENOVESE; MAO, 2019). Arthralgia induced by aromatase inhibitor was the category that included the largest number of studies, with a decrease in pain with the use of acupuncture, auriculotherapy and association of techniques, evidencing the efficacy of the technique with a considerable reduction in edema and pain (ANAND; NIRAVATH, 2019, JANG *et al*., 2020, HERSHMAN *et al*., 2018, LIANG *et al*., 2020, LIU *et al*., 2021, KIN; KANG, 2019, GREENLEE *et al*., 2017, ABBASI, 2018, KIN; KANG; LEE, 2018, KIM; KANG; LEE, 2018, BAE; SONG, 2019, POO *et al*., 2021, BEHZADMEHR *et al*., 2020, CHEN *et al*., 2017, SHIN *et al*., 2019, GENOVESE; MAO, 2018, FRANZOI *et al*., 2021, ROBERTS *et al*., 2017, KIM, KANG, LEE, 2018).

Although acupuncture decreased pain in most studies that evaluated the effect of the intervention on this symptom, one study concluded that the evidence is not strong enough to recommend it for this purpose. Similarly, among the studies that evaluated the efficacy of acupuncture in relation to multiple treatment-related symptoms/complications, including

pain, there was no consensus among the authors. A decrease in pain intensity and interference was observed, but one study presented inconclusive results, concluding that manual acupuncture and auriculotherapy may or may not relieve pain.

Although it goes beyond the scope of this review, it is important to highlight that the use of acupuncture, auriculotherapy and/or the association of integrative techniques increased quality of life, reduced insomnia and improved sleep quality, reduced fatigue, and reduced nausea and vomiting, showing that integrative techniques contribute to a better quality of life and well-being of patients undergoing or post-cancer treatment for breast cancer (ERAN BEN-ARYE *et al*., 2017, JANG *et al*., 2020,YUANQING *et al*., 2020, NARAYANAN *et al*., 2021, JEONG *et al*., 2018, RAZ *et al*., 2020, KIN, KANG, 2019, GREENLEE *et al*., 2017, GRANT *et al*., 2021, LU *et al*., 2021, KIN; KANG, 2019, ZHANG *et al*., 2021, MAO *et al*., 2019, SHIN *et al*., 2019, GENOVESE; MAO, 2019, FRANZOI *et al*., 2021, STOCKIGT, 2021).

In a retrospective study conducted in the United States on the impact of acupuncture on the management of symptoms caused by cancer, a better quality of life was observed for patients (VALLIM *et al*., 2019; BINBIN XU *et al*., 2021), emphasizing the improvement of symptoms such as fatigue, anxiety, physical and emotional suffering (VALLIM *et al*., 2019).

The measurement of the quality of life of cancer patients is an important resource for assessing the implications of treatment outcomes and provides valuable information on the impact of the disease on the physical, functional, social, and emotional aspects of patients. In this sense, quality of life acquires fundamental importance as an objective of cancer treatment, along with traditionally used parameters such as survival time, disease-free interval, tumor response, and toxicity (COSTA *et al*., 2017).

Studies evaluating the efficacy of acupuncture for pain control/chronic pain specifically, reported positive effects such as reduced intensity and lower incidence of chronic pain, as well as pain related to peripheral neuropathy associated with the use of taxanes.

Most oncological pain is chronic, lasting more than three months, being continuous, and there may be episodes of worsening, with acute conditions known as *breakthrough* pain. In chronic cancer pain, in addition to the pharmacological approach, integrative practices should be applied with the aim of offering the patient a more humanized medicine through physical, emotional and spiritual care (ERCOLANI *et al*., 2018).

The possible mechanisms that explain the complex and multiple pathophysiology of cancer pain are: primary afferent nociception (inflammatory factors, tumor-induced acidosis,

tissue compression due to tumor invasion), acute nociception (postoperative), nerve tissue injury and compression, and hyperalgesia due to central sensitization.

Nociceptive pain can be divided into somatic and visceral. Neuropathic pain occurs due to injury to the central or peripheral nervous system (ERCOLANI *et al*. 2018).

According to Traditional Chinese Medicine (TCM), pain results from the condition of excess or deficiency of Qi or blood (TAFFAREL; FREITAS, 2009).

While Western thought was the basis of the so-called modern scientific medicine, the essence of Eastern philosophy was the foundation of the so-called traditional Eastern medicines, especially Chinese (JÚNIOR, 2016). Inadequate pain management favors depressive symptoms, anxiety, impairs cognitive functions, affects daily and social activities, promotes sleep disorders (VALLIM *et al*., 2019). Even with the availability of simple strategies for the treatment of cancer pain, its prevalence demonstrates the urgency of developing actions that lead to more favorable outcomes for patients. Health services have the possibility of incorporating complementary and safe techniques in an attempt to provide better pain control, especially when conventional treatments become limited. Regardless of the choice of the type of therapy for the management of cancer pain, this symptom must be treated and evaluated individually and holistically because it is a particular process and influenced by different factors (RUELA *et al*., 2018).

Considering the National Comprehensive Cancer Network, acupuncture is recommended for cancer pain in adults as one of the integrative interventions, in conjunction with pharmacological interventions (COSTA *et al*., 2017). It should be noted that, in acupuncture, each individual should be considered unique, and that the choice of points should occur according to the course of the meridian and the distribution of the nerves that cross the pain area (COSTA *et al*., 2017).

It is important to mention that few studies reported adverse effects related to the use of acupuncture such as hematoma, pain, and itching, and these did not prevent the use of the technique, which was well accepted by the patients (SOOBIN JANG *et al*., 2020, TING BAO *et al*., 2018, WEIDONG LU *et al*., 2020, XIAOMENG LIU *et al*., 2020, WENZHEN HOU *et al*., 2019, TAE-HUN KIN; JUNG WON KANG, 2019).

CONCLUSION

Acupuncture, auriculotherapy and association of techniques, which uses auriculotherapy together with acupuncture and electroacupuncture, obtained a positive result in pain control in women with breast cancer. Only one study showed the opposite result. Integrative techniques, such as acupuncture, reduce pain and lymphedema, improve

insomnia, fatigue and anxiety, as well as nausea and vomiting caused by chemotherapy, with minimal side effects and good acceptance among patients, leading to a better quality of life.

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