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Effects of acupuncture on the signs and symptoms of people with rheumatic diseases: A scoping review

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ABSTRACT

Introduction: Rheumatic diseases constitute a wide range of chronic diseases that mainly affect the musculoskeletal system. They are characterized by inflammatory and degenerative processes that affect synovial joints, bones, muscles, and connective tissues. In addition, many rheumatological diseases have an autoimmune nature. This diversity of conditions results in a wide range of symptoms and degrees of severity, with a significant impact on patients' quality of life, compromising their daily activities and leading to a decline in mental health, including depressive symptoms and feelings of inadequacy.
Objective: To map the scientific evidence in the literature on the effects of acupuncture on the signs and symptoms of people with rheumatic diseases.
Methods: This is a scoping review, formulated according to the guidelines of the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews checklist.
Results: After the identification, screening and eligibility process, 18 studies were included in this review. All were published between 2002 and 2023; 33.33 % were published in China; and 50 % correspond to clinical trials. The most frequently cited diseases were: acute osteoarthritis or acute knee osteoarthritis (27.77 %); fibromyalgia (27.77 %); and rheumatoid arthritis (27.77 %). The effects of acupuncture on the signs and symptoms of people with rheumatic diseases are pain relief, improved quality of life, improved joint function, increased range of motion, anti-inflammation, reduced fatigue, decreased depression and anxiety symptoms, reduced medication use, immune system regulation, and increased finger mobility.
Conclusions: Acupuncture has beneficial effects on the signs and symptoms of people with rheumatic diseases, constituting a modality which can be easily and quickly applied by any healthcare professional, as long as they are properly trained.

1. Introduction

Rheumatic Diseases (RDs) are defined as a set of different pathologies which affect the locomotor system (bones, joints, cartilage, muscles, tendons and ligaments) or other parts of the body. They affect people of all ages, though the highest prevalence is observed among women aged 30–40 years. According to data from the World Health Organization (WHO), around 38 million people have some

Abbreviations: RDs, Rheumatic Diseases; WHO, World Health Organization; SUS, Sistema Único de Saúde Unified Health System in Brazil; PRISMA-ScR, Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews; OSF, Open Science Framework; PCC, Population, Concept and Context; CINAHL, Cumulative Index to Nursing and Allied Health Literature; CAPES, Catálogo de Teses e Dissertações; UFRN, Universidade Federal do Rio Grande do Norte; AO, Acute Osteoarthritis; AKO, Acute Knee Osteoarthritis; FM, Fibromyalgia; RA, Rheumatoid Arthritis; AS, Ankylosing Spondylitis; NA, Not applicable.

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rheumatological condition, 15 million of which are in Brazil[1,2].

Rheumatic pathologies mostly develop chronically and progressively and present classic symptoms which especially involve the locomotor system, such as pain, limitation of movement and stiffness in the joints. They directly affect the patient's perception of quality of life and can lead to depression and changes in the individual's perception as an active being in society[2–4].

Pain stands out among the most common signs and symptoms, as it has a multifactorial etiology requiring a multidisciplinary and individualized approach according to its intensity, functional status and risk factors. Treatment encompasses pharmacological approaches such as the use of analgesics, anti-inflammatories, muscle relaxants and antidepressants, and non-pharmacological approaches such as acupuncture, physiotherapy and psychological support[2,5].

Therefore, strategies have been sought to reduce painful crises, including acupuncture (its terminology is derived from Latin), in which *acus* means needle and *puntura* means puncture. Acupuncture is based on principles such as: Yin/Yang relationship (opposing forces that complement each other); Theory of the Five Elements; System of energy circulation through the meridians of the human body and etc[6,7].

In turn, its methodology was developed: stimuli are applied through the skin by inserting needles at specific points to regulate Qi flow and restore balance within the body's systems. These acupuncture points have a high concentration of sensory nerve endings and are closely associated with nerves, blood vessels, tendons, periosteums, and joint capsules. Through precise stimulation, acupuncture directly interacts with the Central Nervous System (CNS), triggering the release of neurotransmitters that modulate the neuroendocrine system, producing various physiological effects, including analgesia[6–8].

This central analgesic effect particularly occurs on the thalamus, which plays an important role in processing sensory information. Furthermore, acupuncture releases endorphins in the brain that belong to the group of opioids, which are part of the natural pain suppression mechanism[9–11].

Therefore, this study is justified by the need to expand and disseminate scientific evidence regarding non-pharmacological therapies which help reduce the signs and symptoms present in people with rheumatic diseases, so that it is possible to contribute to improving the quality of life and the social and occupational participation of these individuals. In turn, acupuncture can be a promising modality for these patients, since it can have direct effects on the nervous system by a specific area on the skin, known as an acupuncture point, in addition to being a quick and easy-to-apply, showing good results in the treatment of various pathologies.

Given the above, this study aimed to map scientific evidence in the literature on the effects of acupuncture on the signs and symptoms of people with rheumatic diseases.

2. Methods

This is a scoping review follows the guidelines of the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews checklist (PRISMA-ScR), as well as established structures for conducting and reporting scoping reviews, including those published by the Joanna Briggs Institute, Reviewers 2020 manual, which establishes: the steps for identifying the research question; identification of relevant studies; study selection; data analysis; and data grouping, synthesis and presentation[12].

In order to identify duplicate studies and maintain the originality of this review, a preliminary search for the title was conducted on the following platforms: International Prospective Register of Systematic Reviews, Open Science Framework (OSF), The Cochrane Library, JBI Clinical Online Network of Evidence for Care and Therapeutics and Database of Abstracts of Reviews of Effects. Furthermore, this article was registered on the OSF platform (https://osf.io/ugfq3/).

Therefore, the research question was formulated based on the mnemonic PCC (Population, Concept and Context), being: P - People with rheumatic diseases; C - Effects of acupuncture; and C- Signs and Symptoms. Therefore, the following question was created: "What are the effects of acupuncture on the signs and symptoms of people with rheumatic diseases?".

We used the following descriptors indexed in Health Sciences Descriptors to search data sources: "*Doenças Reumáticas*", "*Acupuntura*" and "*Sinais e Sintomas*"; and indexed in Medical Subject Headings: "Rheumatic Diseases", "Acupuncture" and "Signs and Symptoms". The crossings were carried out using the Boolean "AND" connectors.

Searches were conducted in the following data sources: Cummulative Index to Nursing and Allied Health Literature, Cochrane Library (CINAHL), Directory of Open Access Journals, Google Scholar, *Literatura Latino-Americana em Ciências da Saúde*, Science Direct, Scientific Electronic Library Online, Scopus, Sage Open, Medical Literature Analysis and Retrieval System Online, Web of Science, *Biblioteca Digital de Teses e Dissertações da Universidade de São Paulo, Catálogo de Teses e Dissertações* (CAPES) and *Repositórios Científicos de Acesso Aberto de Portugal*.

Access to CINAHL was through the institutional login linked to the Federal University of Rio Grande do Norte (UFRN) on the EBSCO host platform, while the other sources were accessed through the Periodicals Portal of the Coordination for the Improvement of Level Personnel Higher Education (CAPES) through the Federated Academic Community (CAFe). The search syntaxes were adapted for use in each of the sources, as presented in additional file 1.

Publications available online in full and that answered the research question were included, considering dissertations, theses, ordinances, ministerial publications, guidelines and scientific articles. No limits were applied to the publication date and there were no language restrictions. Abstracts, letters to the editor and opinion articles were disregarded.

The searches were conducted in November 2023 by two researchers who independently examined the title and abstract of all studies found to determine eligibility according to the review selection criteria. Studies considered potentially eligible were selected for full text reading.

A descriptive analysis of the data was performed which was stored in a personalized data extraction spreadsheet developed in the Microsoft Excel spreadsheet version 2019 program. The items included were: data source, author(s), year, country, title, objective, methodological design, level of evidence, most relevant results, advances, limitations, recommendations, interventions and effects of acupuncture on the signs and symptoms of the disease. Data was collected and reviewed by the research team. Any discrepancies in the extracted information were discussed until consensus was reached.

3. Results

The initial search identified 24,225 records. After removing duplicates and records unavailable through access, a total of 1250 titles and abstracts were screened, of which 1174 did not meet the inclusion criteria. The remaining 76 records were examined in full text and 56 were excluded for not answering the research question (n = 43) or not having the method clearly described (n = 16). The remaining 17 studies were included in this review (Fig. 1).

All included studies were published between the years 2002 and 2023, of which four (29,41 %) are from 2018, two (11,76 %) from 2006, two (11,76 %) from 2019, two (11,76 %) from 2014, the other years can be seen in Table 1.

The majority of studies were performed in China, totaling five (29,41 %), followed by the USA with four (23,52 %), the United Kingdom with three (17,64 %), Portugal with three (17,64 %), Iran with one study (5,88 %), and Thailand with one (5,88 %).

Different types of studies were reported, of which nine (52,94 %) were clinical trials and five (29,41 %) were systematic reviews. The other study types were not reported, each corresponding to 5,88 % of

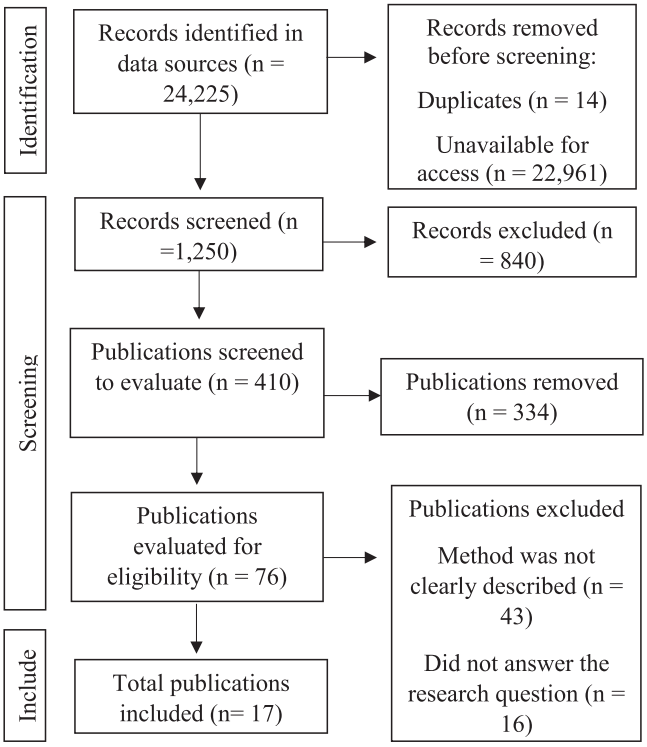

Fig. 1. Search flowchart adapted from PRISMA-ScR. Natal, RN, Brazil, 2023.

Table 1
Characteristics of the studies included in the review. Natal, RN, Brasil, 2023.

Author (year)/ Country	Rhematic disease	Study type	Level of evidence
Sangdee et al. (2002)[13]/Thailand	Acute knee osteoarthritis	Randomized clinical trial	2
Harris et al. (2005)[14]/USA	Fibromyalgia	Randomized clinical trial	2
Linde et al. (2006)[15]/ United Kingdom	Osteoarthritis	Observational study	3
Shi-Yu; Jian-Min; Hai-Tang (2006)[15]/China	Rheumatoid arthritis	Clinical trial	2
Greco et al. (2008)[16]/USA	Systemic lupus erythematosus	Pilot study	4
Cao; Liu; Lewith (2010)[17]/USA	Fibromyalgia	Systematic review	2
Hadianfard; Parizi (2012)[18]/Iran	Fibromyalgia	Randomized clinical trial	2
Tukmachi et al. (2004)[19]/United Kingdom	Acute Knee Osteoarthritis	Randomized clinical trial	2
Yang B et al. (2014)[20]/China	Fibromyalgia	Systematic review with meta-analysis	1
Chen et al. (2015)[21]/United Kingdom	Knee osteoarthritis	Randomized clinical trial	2
Teixeira et al. (2018)[22]/Portugal	Knee osteoarthritis	Case study	4
Chou; Chu. (2018)[23]/China	Rheumatoid arthritis	Systematic review	2
Mist; Jones (2018)[24]/USA	Fibromyalgia	Randomized controlled clinical trial	2
Cao et al. (2018)[25]/China	Rheumatoid arthritis	Randomized clinical trial	2
Seca; Patrício et al. (2019)[26]/Portugal	Rheumatoid arthritis	Clinical trial	2
Seca; Miranda et al. (2019)[27]/Portugal	Rheumatoid arthritis	Systematic review	2
Wang et al. (2023)[28]/China	Systemic lupus erythematosus	Systematic review with meta-analysis	1

the total sample, being: a pilot study, an observational study, a case study.

The method of the Center for Evidence-Based Medicine (CEBM) at the University of Oxford was adopted to evaluate the level of evidence of the studies, designating 12 (70,50 %) as level 2 studies, two (11,76 %) level 1, two (11,76 %) level 4, and one (6,25 %) level 3.

The most cited rheumatic diseases in which the effects of acupuncture were evaluated correspond to: Acute Osteoarthritis (AO) or Acute Knee Osteoarthritis (AKO), cited in five (31,25 %) studies; Fibromyalgia (FM) in five (29,41 %) studies; and Rheumatoid Arthritis (RA) in five studies (29,41 %). Other diseases were mentioned, but in smaller quantities, such as Systemic Lupus Erythematosus in two (11.76 %) studies;

The main information of the selected studies is listed in Table 1, subdivided into: authors, country, year of publication, rheumatic disease, study type and level of evidence, as shown below.

Therefore, it is clear that different effects were identified from applying the interventions, as shown in Table 2, which are listed together with the types of acupuncture and duration of treatments presented by the corresponding studies.

Pain relief was the most reported effect in the studies, present in 14 (77.77 %) of them; followed by improvement in joint function in six (33.33 %) studies; reduced fatigue in four studies (22.22 %); and anti-inflammatory effects in three studies (16.66 %).

Other effects, such as improved mental health (11.11 %), increased handgrip strength (11.11 %), immune function regulation (11.11 %), reduced medication use (5.55 %), increased arm strength (5.55 %) and antioxidant effect (5.55 %) were mentioned less frequently in the selected studies.

Furthermore, it is clear that traditional acupuncture was the most applied modality, being used in 13 (76,47 %) of the sample studies, while moxibustion associated with acupuncture was used in two (11,76 %) and electroacupuncture in two (11,76 %).

Table 3 presents the PAGER structure, showing the most evident characteristics of the studies, gaps and implications for practice and recommendations for future studies on the topic. Thus, it is possible to identify the presence of three acupuncture patterns, namely Traditional Acupuncture (76,47 %), Electroacupuncture (11,76 %) and acupuncture associated with moxibustion (11,76 %).

4. Discussion

4.1. Effects of acupuncture on the signs and symptoms of people with rheumatic diseases

In this review, scientific evidence on the effects of acupuncture on the signs and symptoms of people with rheumatic diseases was highlighted. Therefore, strategies that promote adequate management of these situations are necessary and acupuncture is one of the most recommended non-pharmacological modalities, as it has shown promise in treating rheumatic diseases, especially fibromyalgia due to its action in reducing pain and improving functional capacity[25,32].

As highlighted in this study, pain is the most prevalent condition in people with rheumatic diseases. As a non-invasive therapeutic approach, acupuncture has shown promise in treating acute knee osteoarthritis, offering a safe and effective alternative for controlling pain, improving mobility, discomfort and improving the quality of life of these patients.[33–35].

An overview of systematic reviews presented results showing that acupuncture had a higher total effective rate, short-term effective rate and fewer adverse reactions than Western medicine in treating AKO. Also, combinations of acupuncture with cupping and conventional medication were significantly more effective than conventional medication alone in reducing pain, and this reinforces the benefit of incorporating acupuncture into clinical practice[18,23,33,36].

Similarly, an observational study that investigated the results of

Table 2
Characteristics of the studies included in the review. Natal, RN, Brazil, 2023.

Author (year)	Acupuncture type / treatment Duration	Rheumatic disease	Effects on signs and symptoms
Sangdee et al. (2002)[13]	Electroacupuncture / Three times a week for four weeks.	Knee osteoarthritis	Pain reduction.
Harris et al. (2005)[14]	Traditional acupuncture / Once a week, followed by twice a week and three times a week, totaling 18 treatments.	Fibromyalgia	Reduced pain and fatigue, improved joint function.
Linde et al. (2006)[29]	Traditional acupuncture / Up to 15 sessions of at least 30 minutes (at the discretion of the attending physicians).	Osteoarthritis	Reduced pain and medication use and improved mental health.
Shi-Yu; Jian-Min; Hai-Tang (2006)[15]	Traditional acupuncture / one weekly session for 30 days.	Rheumatoid arthritis	Improved stiffness, sensitivity, swelling, joint function and grip strength.
Greco et al. (2008)[16]	Traditional acupuncture / ten sessions over 5 weeks.	Systhematous erythematosus lúpus	Reduced pain and fatigue.
Cao; Liu; Lewith (2010)[17]	Traditional acupuncture / NA.	Fibromyalgia	Pain reduction.
Hadianfard; Parizi (2012)[18]	Traditional acupuncture / Two weeks of three weekly sessions lasting 30 minutes.	Fibromyalgia	Reduced pain and symptoms of fibromyalgia.
Tukmachi et al. (2004)[19]	Traditional acupuncture and electroacupuncture / Two sessions per week for five weeks.	Knee osteoarthritis	Pain reduction.
Yang B et al. (2014)[20]	Traditional acupuncture and moxibustion (warming of acupuncture points).	Fibromyalgia	Pain reduction.
Chen et al. (2015)[21]	Traditional acupuncture/ Six sessions over 4 weeks.	Knee osteoarthritis	Pain reduction.
Teixeira et al. (2018)[22]	Traditional acupuncture / One session per week for six weeks.	Knee osteoarthritis	Reduced pain and increased joint mobility.
Chou; Chu. (2018)[23]	Traditional acupuncture / NA.	Rheumatoid arthritis	Improved quality of function, anti-inflammatory, antioxidant effect and regulation of immune system function.
Mist; Jones (2018)[24]	Traditional acupuncture / Two 40-minute sessions over 10 weeks.	Fibromyalgia	Reduced pain and fatigue.
Cao et al. (2018)[25]	Traditional acupuncture and moxibustion / One session every three days, consecutively for 10 times.	Rheumatoid arthritis	Relief of joint symptoms and reduction of inflammatory reaction indicators.
Seca; Patrício et al. (2019)[26]	Traditional acupuncture / Two sessions per week for a period of 3 weeks.	Rheumatoid arthritis	Significant improvement in self-reported pain, handgrip strength and arm strength.
Seca; Miranda et al. (2019)[27]	Traditional acupuncture / NA.	Rheumatoid arthritis	Pain relief and improved physical function.
Wang et al. (2023)[28]	Traditional acupuncture / NA.	Systhematous erythematosus lúpus	Improvement in fatigue, depression, pain and related immunological parameters.

Legend: NA = not applicable.

patients undergoing acupuncture treatment for chronic pain due to osteoarthritis showed clinically relevant improvements after treatment and 6 months after inclusion, in which the patients reported reduced pain, medication use and improvement in mental health, with a reduction in scores indicative of depression[37].

Furthermore, studies that compared the effectiveness of electroacupuncture, diclofenac and their combination in the symptomatic treatment of AKO showed that EA is significantly more effective when compared to placebo and diclofenac in exerting an adequate analgesic effect, as the positive effects far outweigh the serious adverse effects of EA[14,20].

Thus, the effects of longitudinal acupuncture treatment on brain functional connectivity and clinical outcome measures in patients with AKO showed that acupuncture treatment can significantly modulate brain functional connectivity, interfering with pain-evoked sensorimotor changes in the knee to ease the painful experience[21,38].

In this sense, acupuncture also showed promising results in increasing the range of motion in patients with rheumatoid arthritis after applying laser acupuncture, with a significant increase in movement, making it possible to infer that acupuncture alone or in combination are beneficial for the clinical conditions of RA and can improve function and quality of life[24,39].

In addition, a reduction in the percentage of signs and symptoms of RA was observed in a clinical trial carried out in China, as well as an improvement in the therapeutic effect index after performing acupuncture combined with the use of the drug Methotrexate, with an improvement in stiffness, sensitivity, joint edema and handgrip strength of patients after treatment[16].

Furthermore, moxibustion therapy associated with acupuncture at specific acupuncture points significantly alleviates joint symptoms, reduces indicators of inflammatory reaction, and improves clinical therapeutic effects in RA to different degrees in patients[26,27,30], also being effective in improving of the signs and symptoms of patients with ankylosing spondylitis[28].

In a similar way, patients with systemic lupus erythematosus benefited after acupuncture sessions, especially when associated with traditional medication, with improvements in pain, fatigue, depressive symptoms and related immunological parameters being observed[17,31].

No adverse events were associated with acupuncture interventions in these studies, although two-thirds of participants reported mild, transient side effects such as brief needle pain, dizziness, or local bruising[17].

For the duration of effects, acupuncture produces a minimal noticeable clinical improvement and can be efficient for patients with low levels of pain or to alleviate pain due to AKO in the short term; in addition, it has a good therapeutic effect, but of short duration in treating rheumatic diseases, such as fibromyalgia, maintained for 1–3 months, with the first month having the best therapeutic effect[19,21,40].

In the other studies analyzed, it was seen that acupuncture application for six to 13 weeks had a beneficial effect compared to sham acupuncture; however, when the treatment sessions lasted less than six weeks or 26 weeks, there was no statistical difference between the true acupuncture and sham acupuncture. In addition, no serious adverse events were found in studies[18,41–43].

The results indicate that the choice of acupuncture points is

Table 3
PAGER Structure, Natal, RN, Brazil, 2023.

Acupuncture type	Advances	Gaps	Evidence for practice	Study recommendations
Traditional acupuncture[29,15,17–25,27,30,31]	Acupuncture alone or combined with other treatment modalities can improve function and quality of life. Improvements in clinical pain, fatigue and physical function.	Uncontrolled design and high proportion of patients lost to follow-up. Small sample size.	The overall acupunture treatment effect, with three weekly sessions promotes more analgesia than once-weekly sessions. Acupuncture appears to be a viable treatment option for treating osteoarthritic pain. Acupuncture therapy can improve medication side effect.	Future RCTs with high-quality designs, with large-scale samples, validated long-term outcome measures for RA, appropriate control groups, appropriate sham methods, true double-blinding, and applying CONSORT guidelines are recommended.
Electroacupuncture (EA)[14]	EA can exert an adequate analgesic effect.	Not described.	The positive effects far outweigh the serious adverse effects of AS, making this procedure an attractive treatment alternative for patients with knee OA.	Conduct new randomized clinical trial studies.
Acupuncture associated with moxibustion[21,26,28]	Moxibustion + Western medicine can improve efficacy, alleviate inflammatory response, and improve the patient's signs and symptoms and immune indices.	Small sample size, short duration of the study design, and unique type of evidence.	The combination of moxibustion and moxibustion in moxibustion box can stimulate and strengthen Yang energy to warm the body and then promote the flow of Qi and blood, ultimately achieving the purpose of clearing the flow of Qi, harmonizing Qi and blood and restore physiological functions, thus effectively improving the therapeutic effect, relieving the inflammatory response and improving clinical symptoms.	There is a need to further expand the sample size and carry out in-depth studies on different types of patients.

Source: study data, 2023.

important for the treatment of knee osteoarthritis. Stimulation of both distais points, i.e., points further from the knee joint, and proximal points or painful trigger points, provided greater pain relief and increased range of motion. As well as the correct location of acupuncture points, the frequency of therapy, i.e., the regularity of acupuncture sessions, is an important factor for long-term pain control.[44,45].

It can be seen that traditional acupuncture and moxibustion were represented with a large number of advances, improving patients' signs and symptoms based on mechanisms such as relieving the inflammatory response and regulating the immune system, EA showed a significant analgesic effect, and this technique can be used more widely, improving hormonal regulation, the immune system acting systemically, and enhancing the stimulation of acupuncture points.[29,15,17,18,21,26,28].

4.2. Frequency of acupuncture sessions applied to people with rheumatic diseases

Studies have shown acupuncture protocols lasting two to ten weeks, with application one to three times a week[14,29,15–27,30,28,31].

The frequency of treatments involving acupuncture is relevant for success, osteoarthritis treatment, for example, it was evidenced that low-frequency electroacupuncture (2 Hz), applied 3 times a week for 4 weeks, is an effective protocol. The treatment frequency and duration, combined with the alternation of polarity, ensure long-lasting pain relief and a significant improvement in patients' quality of life[14].

Regarding traditional acupuncture, it was observed that patients reported less pain, medication use and disability, better physical health, mental health, better sensory and affective aspects of pain, and reduced depression during acupuncture treatment and 6 months after completion[15].

In patients with lupus, 10 acupuncture sessions have been shown to be effective in reducing pain, suggesting that this number of sessions may be adequate for treatment. In fibromyalgia, maximum benefit in fibromyalgia was observed at 4 weeks, and this benefit was less significant at 8 weeks[17,19,21].

In patients with chronic pain of various etiologies, the studies showed that after 10 days, 2 weeks, 3 weeks, 4 weeks and 3 months of acupuncture treatment, the differences in pain scores between the control group and the experimental group were statistically significant, thus it is suggested that wrist and ankle acupuncture used independently or in conjunction with other types of treatment has a positive effect on chronic pain. and can be used to treat pain clinically instead of oral medication, considering aspects such as adverse events and other factors[45].

In addition, positive evidence was listed for applying acupuncture in practice, such as effectiveness in treating AKO, the relief of medication side effects and pain reduction, corroborating the increase in the level of reliability of studies and the development of research in the area[15,20,22,23].

A low sample size was the most frequently reported gap between studies. Furthermore, the considerable number of patients lost to follow-up and the unique type of evidence were also examples of gaps, highlighted in the research recommendations, which also recommended carrying out high-quality RCTs whose groups have lower dropout rate (among other updates)[14,29,15,21,26,28,31].

5. Conclusion

The present review highlighted the effects of acupuncture on the signs and symptoms of patients with rheumatic diseases: pain relief, improved joint function, increased range of motion, reduced fatigue, reduced depression and anxiety symptoms and increased finger mobility.

The analgesic effect of acupuncture practice stood out as a relevant factor, given that pain is the symptom which most weakens people with rheumatic diseases, often making it impossible for them to carry out their daily activities, and thereby significantly impacting their quality of life. Therefore, acupuncture is useful as a non-pharmacological strategy to control the signs and symptoms of rheumatic diseases, and can be used alone or associated with traditional drug treatment.

As limitations of this study, it is clear that there is a risk of bias resulting from insufficient reporting of methodological components. Moreover, there are factors that can potentially interfere with the results, such as age, duration and pain intensity felt by each patient, in addition to the lack of blinding in most clinical trials. The use of the term "signs and symptoms" as MeSH is also considered a limitation, since this term requires specific attention when analyzing studies.

However, despite its limitations, it was possible to map existing data

and this should stimulate new research that can address pain more specifically, because this is the main condition that affects people with rheumatological diseases, to enrich the scientific literature in the field of oriental medicine and definitively consolidate its therapeutic effect, with the aim of producing significant and systematic evidence through highly methodologically rigorous studies on acupuncture.

Thus, it is noted that acupuncture has the potential to improve the clinical condition of people with rheumatic diseases from different perspectives, as it causes psychological, physical and behavioral repercussions which are not only capable of mitigating an inflammatory process, but also changing and improving life habits.

Authors' contributions

MES and EBBM designed and implemented the study, participated in the search, extraction and analysis of data, wrote the initial and final versions of the article. Researchers MALC, LLS, SOS, NTBL, and JFF examined the literature and extracted data. MES and EBBM statistically analyzed the data. SOS, NTBL, and DVD helped revise the language and logic of the manuscript. DVD and RAND provided critical comments on the manuscript and participated in the initial construction of the article. All authors (MES, EBBM, MALC, LLS, SOS, NTBL, JFF) contributed to the interpretation of results and review of drafts and approved the final version of the manuscript.

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CRediT authorship contribution statement

Dantas Rodrigo Assis Neves: Writing – review & editing, Writing – original draft, Visualization, Validation, Project administration, Methodology, Formal analysis. **Fonseca Jucielly Ferreira da:** Writing – original draft, Visualization, Validation. **Leal Nahadja Tahaynara Barros:** Writing – original draft, Visualization, Validation, Resources, Methodology. **Silva Silmara de Oliveira:** Writing – original draft, Supervision, Resources, Methodology. **Dantas Daniele Vieira:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Formal analysis, Conceptualization. **Souza Laura Lima:** Writing – original draft, Visualization, Investigation, Data curation. **Cabral Maria Amélia Lopes:** Writing – review & editing, Investigation, Conceptualization. **Melo Evelin Beatriz Bezerra de:** Writing – original draft, Investigation, Data curation. **Elivânia Silva Mariane:** Writing – review & editing, Writing – original draft, Validation, Supervision, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Not applicable.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ctim.2025.103183.

Data availability

All data generated or analyzed during this study are included in this article.

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