Effectiveness and safety of yoga to treat chronic and acute pain: a rapid review of systematic reviews

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ABSTRACT

Background Pain is a sensation of discomfort that affects a large part of the population. Yoga is indicated to treat various health conditions, including chronic and acute pain. Objective To evaluate the effectiveness and safety of yoga to treat acute or chronic pain in the adult and elderly population. Study selection A rapid review was carried out, following a protocol established a priori. Searches were carried out in September 2019, in six databases, using PICO and MeSH (Medical Subject Headings) and DeCS (Descriptores em Ciências da Saúde) terms. Systematic reviews were included, and methodological quality was assessed using Assessing the Methodological Quality of Systematic Reviews. The results were presented in a narrative synthesis. Findings Ten systematic reviews were selected. Two reviews were assessed as of high methodological quality, two as of low quality, and six of critically low quality. Results were favourable to yoga compared with usual daily care, particularly in low back and cervical pain cases. There was little evidence about the superiority of yoga compared with active interventions (exercises, pilates or complementary and complementary medicine). It was also less consistent in pain associated with fibromyalgia, osteoarthritis, rheumatoid arthritis, carpal tunnel and irritable bowel syndromes. There was an improvement in the quality of life and mood of the participants, especially for yoga compared with usual care, exercises and waiting list. Conclusions Overall, the results were favourable to yoga compared with usual care in low back and cervical pain cases. The evidence is insufficient to assert yoga’s benefits for other pain conditions, as well as its superiority over active interventions. The findings must be considered with caution, given their low methodological quality and the small samples in the primary studies reported in the included systematic reviews. Thus, more studies must be carried out to improve the reliability of the results.

BACKGROUND

Pain is a major biopsychosocial problem worldwide because it affects the quality of life of individuals and causes considerable economic impact. Pain is a subjective nature and can be described as an “unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage”. Although there is still no consensus on the definition of pain, according to the International Association for the Study of Pain it can be classified as either acute (lasts from a few seconds to 30 days) or chronic (more than 3 months to several years).

In 2017, the USA, Germany, France, Italy, Spain, UK and Japan reported an estimated 119,619,121 cases of acute pain related to surgery, trauma or other disease conditions. In the USA, acute pain was reported by 41,766,061 patients after surgery and by 34,068,366 patients with traumatic injury. Between the European countries studied, Germany and the UK registered the highest number of acute pain cases.

Pain is frequent in elderly people. Among residents from long-term care facilities, 49%–83% report that they were regularly in pain. More than 63% of older patients seen in primary healthcare also complain about acute pain. These symptoms were responsible for 69% of the accounted disability in daily routine life activities.
A systematic review (SR) showed that low-back pain is the most prevalent, affecting 51%–84% of the general population, followed by cervical pain (15.4%–45.3%). Pain can become a chronic condition that impacts an estimated 10%–55% of the population worldwide. According to the EuroPain Study, for example, pain episodes in Europe, for example, compromise up to 3.0% of gross domestic product, with an annual cost higher than cancer and many heart diseases. 

In this context, non-pharmacological therapies, such as yoga, have been indicated to manage acute or chronic pain. Yoga is an integrative mind–body practice of oriental origin that involves three main elements: body positions (asana), techniques for controlling and/or regulating breathing (pranayama), and meditation and/or relaxation (samayama). Currently, there are several yoga types, which differ mainly due to variations in the intensity, difficulty and duration of the postures, in addition to variations in the meditation and breathing techniques. ‘Hatha yoga’ and ‘integrative yoga’ are the terms commonly used to refer to several types of yoga practice, including those most used in Western societies, such as Iyengar and Vinyasa yoga or Vinivoga. Such yoga types have been used for many purposes, like physical rehabilitation and comprehensive care for emotionally traumatised individuals.

The number of people who practice yoga has been increasing in recent years in Western countries. For example, in the USA, a study reported that approximately 31 million adult Americans have already practised yoga for the prevention of diseases and back pain relief. In Brazil, a survey carried out by the Ministry of Health (MoH) in 2004 showed that 14.6% of the municipalities and states offered yoga at that time, mainly in primary healthcare. Also, yoga was incorporated into the National Policy of Integrative and Complementary Practices in Health, which instituted the offer of traditional and complementary medicines in the Brazilian Unified Health System (SUS). The incorporation of yoga in the SUS is officially justified by possible cognitive, musculoskeletal, endocrine and respiratory benefits. For that reason, the number of healthcare providers offering yoga sessions in the SUS increased from 565 in 2017 to 7732 in 2019, as well as the number of patients assisted (from 3870 to 43 459, respectively).

METHODS
Rapid review of SRs carried out by demand of the Brazilian MoH. Rapid reviews are appropriate to provide decision makers with the best available evidence in a short time. A research protocol was previously prepared, describing the eligibility criteria, articles selection, data extraction and methodological quality assessment (online supplemental file 1). This review adhered the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 reporting guidelines.

Eligibility criteria
The research question was developed following PICOS framework: P=adults and elderly with acute or chronic pain; I=yoga; C=usual treatment, placebo, or no treatment; O=reduction or control of acute or chronic pain and adverse events; S=SRs, with or without meta-analysis. Searches and selection of studies were guided by the following question: What is the effectiveness and safety of yoga practice to treat acute or chronic pain in an adult population, compared with usual treatments, placebo, or no treatment, based on the evidence of SRs?

We searched by SRs of randomised controlled trials (RCT), quasi-RCT, observational studies or qualitative studies, with or without meta-analysis, published in English, Spanish and Portuguese, with no restriction to publication date. Overviews, scoping reviews, integrative reviews, synthesis of evidence for policies, health technology assessment studies, economic assessment studies and primary studies were excluded. Studies that presented pain as a secondary outcome or did not present a clear report on the results were excluded.

Search
Searches were carried out on 27 September 2019, by two researchers, in indexed databases PubMed, Health Systems Evidence (HSE), Epistemonikos, VHL (Virtual Health Library) Regional Portal, Health Evidence (HE) and Embase. The search strategies combined keywords from the PICOS acronym, using MeSH (Medical Subject Headings) terms in PubMed and DeCS (Descritores em Ciências da Saúde) terms in the VHL, adapting them to HSE, Epistemonikos, HE and Embase. The terms used were: “yoga”, “acute pain”, “chronic pain”, “ioga”, “dolor agudo”, “dolor crónico”, “dor aguda” and “dor crónica”. The SR filter was used in three databases (PubMed, Epistemonikos, VHL Regional Portal) (online supplemental file 2).

Study selection and data extraction
The SRs retrieved were uploaded to Rayyan reference management web application. The screening process followed the steps of excluding duplicates and then reading titles and abstracts. The eligible articles were read in full. Those that did not meet the objectives of this rapid review were excluded. Using an Excel spreadsheet, the following data were extracted from the included studies: authorship, publication year, aims, intervention, comparators, results, limitations, conflicts of interest and last year searched. Both the study selection and data extraction were carried out by two reviewers independently. Conflicts were resolved by a third reviewer.

Quality assessment
Two reviewers independently assessed the methodological quality of studies with the Assessing the Methodological Quality of Systematic Reviews (AMSTAR 2) tool. Assessment disagreements between reviewers were resolved through consensus. To classify the overall confidence in
the results of the SRs, the ‘critical domains’ considered were the same suggest by the authors of AMSTAR 2 in their original article: study protocol (item 2); comprehensive search strategy (item 4); list of excluded studies with justification (item 7); adequate technique to assess the risk of bias in each study included in the review (item 9); appropriate methods for meta-analysis (item 11); risk of bias in each study when interpreting the results (item 13); and publication bias (item 15). Cohen’s kappa statistic was calculated to estimate each domain’s inter-rater reliability (IRR).

Synthesis of results
Results were analysed based on the effect size measures informed by the SRs (MD: means difference; RR: risk ratio; SMD: standardised means difference; 95% CI; I^2: heterogeneity measure). A narrative synthesis of the results was prepared for each outcome about benefits and adverse events.

Patient and public involvement
No patients or public participated in any stage of this review. Results were presented to decision makers.

RESULTS
Selection
The PRISMA flow diagram shows the selection process (figure 1). Searches yielded 693 references, of which 250 remained for screening of titles and abstracts after duplicates were removed. Records were excluded after screening because they were a duplicate (4.8% out of 250), full-text not available (1.2%) or for not meeting at least one of the eligibility criteria: outcome (40.4%), not an SR (27.6%), population (14%) or intervention (2.8%). Twenty-three reviews were read in full to check eligibility and 13 were excluded for the following reasons: not an SR 22–29 not a yoga intervention or necessary data unavailable for extraction. Thus 10 SRs were included, 12 35–43 eight with meta-analysis (online supplemental file 3).

STUDIES CHARACTERISTICS
Primary studies included in the SRs were conducted in the USA (5), India (4), Sweden (3), Germany (2), China (2), Korea (2), England (2), Brazil (2), Spain (1) and Turkey (1). Five reviews did not present this information. 12 40–43

The studies included in the reviews analysed different types of yoga, the most frequent ones being yoga iyengar, hatha yoga and vinyasa, yogic mind resonance technique, yoga of awareness, yoga-based special techniques yogic meditation and two reviews did not specify a yoga type used. 12 40

Yoga was combined with home practice, daily mostly, educational resources (booklets, guides, newsletters) about yoga or pain, CDs (Compact Disc) or DVDs (Digital Versatile Disc), physiotherapy, relaxation, education, occupational therapy sessions and usual care.

The person responsible for the practice was mentioned to be an experienced yoga teacher, but this information was not available for the majority of SRs included. 12 35 36–42

The duration of sessions ranged from 15 min to 3 hours and frequency varied from one to seven times per week. The follow-up of participants continued for the minimum of 12–43 and maximum of 24 weeks.

Comparisons were made to usual care, educational interventions, standard medical care, exercises and delayed treatment. Yoga interventions were also compared with waiting list controls, mostly unspecified, but in one case there was a subsequent offer of intervention or treatment at some point or at the end of the study. Other integrative practices such as Tai-chi or pilates or no intervention were compared as well.

SRs described results on the following outcomes: pain, functional capacity, psychosocial outcomes, quality of life, specific back deficiency, overall clinical improvement and adverse events. The effectiveness of yoga was assessed in reducing low-back pain; cervical pain; pain associated with irritable bowel syndrome; pain associated with carpal tunnel syndrome; pain caused by musculoskeletal conditions; and chronic non-malignant pain.

Pain after yoga was measured using the following scales and questionnaires: Visual Analogue Scale

Patient and public involvement
No patients or public participated in any stage of this review. Results were presented to decision makers.
Six SRs evaluated the effectiveness of yoga in reducing low-back pain in patients with chronic pain \cite{12, 37, 38, 41, 42} or low-back pain in general.\cite{43} Comparisons were made to usual care, exercise, educational interventions, attention control and waiting list individuals.

Compared with usual care, medical care or education,\cite{42} yoga decreased low-back pain in the short term, that is, right after the intervention and 12 weeks after randomisation, (6 RCT, 584 patients, SMD=−0.48; 95% CI −0.65 to −0.31; I²=0%) and in the long term a year after randomisation (6 RCT, 564 patients, SMD=−0.33; 95% CI −0.59 to −0.07; I²=48%). In comparison to attention control or waiting list,\cite{38} yoga was associated with moderately larger effects on short term, 1 to <6 months (5 RCT, 770 patients, pooled difference=−1.10; 95% CI −1.77 to −0.42; I²=74%) and intermediate term, ≥6 to <12 months (2 RCT, 271 patients, pooled difference=−1.17; 95% CI −1.91 to −4.44; I²=26%). Also, yoga showed a intermediate-term effect of large magnitude (26–32 weeks) for non-specific chronic low-back pain control (2 trials, 88 participants, pooled SMD=0.92; 95% CI 0.47 to 1.37; heterogeneity not reported) compared with education through a self-care book without physical exercises.\cite{41} Moreover, yoga showed a moderate overall effect on reducing low-back pain (4 RCT, number of participants not informed, SMD=−0.61; 95% CI −0.97 to −0.26; I²=63%) compared with passive interventions (usual daily care, waiting list, educational or social environment).\cite{43} Compared with no exercise,\cite{37} the results favoured yoga as way of reducing low-back pain in the follow-up of 4–6 weeks (2 RCT, 40 participants, MD=−10.83; 95% CI −20.85 to −0.81; I²=0%), 3–4 months (5 RCT, 458 participants, MD=−4.55; 95% CI −7.04 to −2.06; I²=0%), and at 6 months (4 RCT, 414 participants, MD=−7.81; 95% CI −13.37 to −2.25; I²=64%). At 12 months, the differences were not statistically significant. These results were moderate confidence at 6 months, but low to very low confidence in other follow-up points.

Furthermore, results favoured yoga compared with the practice of exercises after 1 week intensive practice (1 RCT, 80 participants, MD=−14.50; 95% CI −22.92 to −6.08; heterogeneity not applicable), 4 weeks (1 RCT, 54 participants, MD=−15.00; 95% CI −19.90 to −10.10; heterogeneity not applicable) and 7 months (1 RCT, 54 participants, MD=−20.40; 95% CI −25.48 to −15.32; heterogeneity not applicable). However, these results analyse single studies with small samples.\cite{37} A second SR that compared yoga to physical exercise\cite{38} found heterogeneous results not statistically significant.

A review without meta-analysis\cite{12} reported that yoga effectively reduced chronic low-back pain. However, two studies included in the review pointed out that there was no evidence of pain improvement.

**Low-back pain-related disability**

Yoga practice compared with usual daily care, medical care or education\cite{12} contributed to reduce specific disability associated with low-back pain in the short term, right after the intervention and 12 weeks after randomisation (8 RCT, 689 patients, SMD=−0.59; 95% CI −0.87 to −0.31; I²=0%) and in the long term a year after randomisation (6 RCT, 564 patients, SMD=−0.33; 95% CI −0.59 to −0.07; I²=48%). In comparison to attention control or waiting list,\cite{38} yoga was associated with moderately larger effects on short term, 1 to <6 months (5 RCT, 770 patients, pooled difference=−1.10; 95% CI −1.77 to −0.42; I²=74%) and intermediate term, ≥6 to <12 months (2 RCT, 271 patients, pooled difference=−1.17; 95% CI −1.91 to −4.44; I²=26%). Also, yoga showed a intermediate-term effect of large magnitude (26–32 weeks) for non-specific chronic low-back pain control (2 trials, 88 participants, pooled SMD=0.92; 95% CI 0.47 to 1.37; heterogeneity not reported) compared with education through a self-care book without physical exercises.\cite{41} Moreover, yoga showed a moderate overall effect on reducing low-back pain (4 RCT, number of participants not informed, SMD=−0.61; 95% CI −0.97 to −0.26; I²=63%) compared with passive interventions (usual daily care, waiting list, educational or social environment).\cite{43} Compared with no exercise,\cite{37} the results favoured yoga as way of reducing low-back pain in the follow-up of 4–6 weeks (2 RCT, 40 participants, MD=−10.83; 95% CI −20.85 to −0.81; I²=0%), 3–4 months (5 RCT, 458 participants, MD=−4.55; 95% CI −7.04 to −2.06; I²=0%), and at 6 months (4 RCT, 414 participants, MD=−7.81; 95% CI −13.37 to −2.25; I²=64%). At 12 months, the differences were not statistically significant. These results were moderate confidence at 6 months, but low to very low confidence in other follow-up points.

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to -0.30; I²=99%) and long term a year after randomisation (5 RCT, 574 patients, SMD=-0.35; 95% CI -0.55 to -0.15; I²=20%). Also, yoga showed a moderate effect on improving functionality in patients with low-back pain compared with reading self-care books and exercises (8 RCT, number of participants not informed, SMD=-0.64; 95% CI -0.89 to -0.39; I²=62%).

In the same way, results favoured yoga when it was compared with no exercise. Improvement was observed in the follow-ups of 4–6 weeks (5 RCT, 256 participants, SMD=-0.45; 95% CI -0.71 to -0.19; I²=0%), 3–4 months (7 RCT, 667 participants, SMD=-0.40; 95% CI -0.66 to -0.14; I²=54%), 6 months (6 RCT, 630 participants, SMD=-0.44; 95% CI -0.66 to -0.22; I²=34%) and 12 months (2 RCT, 365 participants, SMD=-0.26; 95% CI -0.46 to -0.05; I²=0%). The evidence, however, was considered of moderate confidence at 6 months and of low confidence for the other periods. When yoga was compared with exercise no differences were observed in specific back functionality.37

### Low-back pain clinical improvement

Concerning clinical improvement, yoga did better compared with no exercise after 4–6 weeks (2 RCT, 141 participants, RR=2.62; 95% CI 1.22 to 5.67; I²=0%), at 3 months (3 RCT, 168 participants, RR=3.18; 95% CI 1.86 to 5.44; I²=0%), and at 6 months (1 RCT, 128 participants, RR=2.53; 95% CI 1.36 to 4.71; heterogeneity measure not applicable).37 However, such evidence was considered of low confidence. Otherwise, yoga compared with exercise showed no statistically significant difference in clinical improvement.

### Cervical pain

A meta-analysis36 showed better short-term (not specified) effects of yoga on the intensity of neck pain compared with usual care (3 RCT, 182 participants, SMD=-1.28; 95% CI -1.81 to -0.75; I²=62%). Yoga also showed better results than exercises (8 RCT and 1 q-RCT, 488 participants, SMD=-1.26; 95% CI -1.83 to -0.68; I²=87%). However, authors found no statistically significant differences comparing yoga to pilates or complementary and complementary medicine.39

### Cervical pain-related disability

Compared with usual care, yoga showed better short-term (not specified) effects on cervical pain-related disability (3 RCT, 182 participants, SMD=-0.97; 95% CI -1.44 to -0.50; I²=55%).36 In comparison to exercise, yoga was superior in reducing disability (6 RCT and 1 q-RCT, 363 participants, SMD=-0.97, 95% CI -1.55 to -0.38; I²=82%), but there was no significant difference when compared with pilates or complementary and complementary medicine.

### Pain associated with fibromyalgia syndrome

Practicing yoga reduced the pain associated with fibromyalgia syndrome in the short term (not specified) compared with late or usual treatment (2 RCT, 88 patients, SMD=-0.54; 95% CI -0.96 to -0.11; I²=0%).35

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**Pain associated with osteoarthritis and rheumatoid arthritis, and carpal tunnel and irritable bowel syndromes**

Yoga significantly improved hand pain associated with osteoarthritis (after 8 weeks) and rheumatoid arthritis (after 40 days) compared with passive interventions.43 One SR included one study that showed improvement in pain and physical function assessments in osteoarthritis. Also, a second study found improvement in joint sensitivity and hand pain during yoga.40

An SR considered yoga and standard care (eg, wearing a wrist splint) equally beneficial to carpal tunnel syndrome pain based in one primary study.12 Another study in the same review reported that yoga was not an effective treatment option for irritable bowel syndrome pain.

### Quality of life and mood

Compared with usual care, yoga improved quality of life (2 RCT, 128 participants, SMD=0.57; 95% CI 0.17 to 0.97; I²=20%) and mood (2 RCT, 128 participants, SMD=-1.02; 95% CI -1.38 to -0.65; I²=0%) in patients with cervical pain.36

Yoga compared with delayed treatment control in patients with fibromyalgia improved the quality of life (1 RCT, 53 participants, SMD=-0.71, 95% CI -1.27 to -0.15, heterogeneity measure not applicable) and depression (1 RCT, 53 participants, SMD=-0.84, 95% CI -1.41 to -0.28, heterogeneity measure not applicable) at the end of the treatment.35

Yoga compared with non-exercise controls improved the physical quality of life after 6 months (1 RCT, 259 participants, SMD=0.26, 95% CI 0.01 to 0.50, heterogeneity measure not applicable), and depression decrease 4–6 weeks after the intervention (1 RCT, 16 participants, SMD = -1.23, 95% CI -2.39 to -0.65, heterogeneity measure not applicable). The intervention also decreased depression in participants with chronic low-back pain after 6 months (1 RCT, 90 participants, SMD=-0.47, 95% CI -0.89 to -0.05, heterogeneity measure not applicable) and 12 months (1 RCT, 90 participants, SMD=-0.50, 95% CI -0.92 to -0.08, heterogeneity measure not applicable).37

Yoga compared with exercises improved quality of life (3 RCT, 434 participants, MD=3.46, 95% CI 0.75 to 6.16, I²=61%) and mood (4 RCT, 351 participants, MD=0.61, 95% CI 0.95 to 0.27, I²=58%) in patients with chronic cervical pain.39 Yoga compared with exercise controls showed an effect in the physical quality of life of chronic low-back pain patients after 4 weeks (1 RCT, 54 participants, SMD=1.68, 95% CI 1.06 to 2.31, heterogeneity measure not applicable) and after 7 months (1 RCT, 54 participants, SMD 1.34, 95% CI 0.75 to 1.94, heterogeneity measure not applicable). Yoga compared with exercise controls improved the mental quality of life after 4 weeks (1 RCT, 54 participants, SMD=0.79, 95% CI 0.24 to 1.35, heterogeneity measure not applicable) and after 7 months (1 RCT, 54 participants, SMD=1.33, 95% CI 0.74 to 1.92, heterogeneity measure not applicable).37
Safety of yoga

Seven SRs reported information about adverse events associated with yoga. Three showed that yoga was not associated with serious adverse events. Nevertheless, yoga was associated with increased low-back pain in some patients and an unspecified severe adverse event increased pain and herniated disc, and a case of cellulitis. Moreover, one SR found no differences between reports of adverse events comparing yoga to other exercises.

DISCUSSION

Overall, SRs favoured yoga compared with usual care, particularly in low back and cervical pain. Alternatively, there is little evidence about the superiority of yoga compared with active interventions. Furthermore, the effectiveness of yoga was unclear for other conditions identified, such as pain associated with fibromyalgia, osteoarthritis, rheumatoid arthritis, carpal tunnel and irritable bowel syndromes. Considering the seven SRs that provided information about safety, three reported no adverse events and another three found no severe adverse events (cellulitis, herniated disc and unspecified severe adverse event) related to the intervention. Hence, the results of this rapid review suggest yoga can benefit health without harm.

In Brazil, the MoH has regulated integrative and complementary practices in the Unified Health System to promote health and quality of life through less invasive techniques. A Brazilian study highlighted the positive effects of integrative and complementary practices such as yoga in primary healthcare. It indicated that such interventions are easy to implement, mainly because they grant autonomy and allow patients to cope with illness. However, it should be noted that the lack of infrastructure and poor communication with other health services may damage its effectiveness.

Comparison with other evidence

Similarly to what this rapid review found, the overview by Fishbein and Saper points out that yoga is not related to high rates of serious adverse events. However, yoga should be performed according to each individual’s health condition. The study also indicates that the small sample size and lack of appropriate methods conducting primary studies diminish the quality of the evidence about the benefits of yoga.

Furthermore, a second overview targeting adults with acute and chronic health problems showed the benefits of yoga to pain control. The findings also stress the lack of robustness of the studies, which compromises the evidence.

Strengths and limitations

This rapid review was carried out in 45 days, simplifying steps from a traditional SR. Nonetheless, the shortcuts employed have followed a validated methodological guideline and the risks of them leading to inaccurate findings were considered.

The lack of information about the quality of primary studies included in the SRs decreased confidence in their results. It is noteworthy that even SRs themselves lack methodological rigour, since most of them were rated low or critically low overall confidence. The results are also based on primary studies with small samples, significant heterogeneity regarding the design of interventions, and considerable risk of bias. Hence, it is difficult to evaluate the effectiveness of yoga, and many uncertainties remain concerning its benefit.

CONCLUSION

Yoga can be an effective and safe practice to control chronic and acute pain, primarily in patients with low back or chronic cervical pain. Otherwise, the results were not very consistent for people with pain associated with osteoarthritis, rheumatoid arthritis, fibromyalgia, carpal tunnel and irritable bowel syndromes. Overviews of SRs highlighted the benefit of yoga for controlling acute and chronic pain, which corroborates the findings of this review. Therefore, more research is needed to increase the quality and strength of these results.

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Ethics approval This study does not involve human participants.

Provenance and peer review Not commissioned; externally peer reviewed.

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Supplementary file 1. Rapid review protocol

Yoga for the treatment of acute or chronic pain in adults and the elderly

1. Background

1.1 The technology

Yoga is characterized as an integrative practice of oriental origin that combines body positions, breathing techniques, meditation and relaxation. Its practice benefits the musculoskeletal, endocrine and respiratory systems and stimulates cognitive functions. In a survey carried out by the Ministry of Health in 2004 for the elaboration of the National Policy for Integrative and Complementary Practices in Health, 14.6% of the municipalities and states of the federation had already reported the use of this complementary practice, inserted mainly in Primary Care - Family Health. Yoga practice "improves quality of life, reduces stress, decreases heart rate and blood pressure, relieves anxiety, depression and insomnia, improves physical fitness, strength and general flexibility"2.

This is a practice incorporated by Ordinance GM No. 849 of March 27, 20172, to the National Policy of Integrative and Complementary Practices in Health (PNPIC), which institutes the offer of traditional and complementary medicines in the Brazilian public health system (SUS).

1.2 Registration of technology with Anvisa

The technology is not subject to registration with Anvisa.

1.3 Stage of incorporation into SUS

Until the present date, this technology has not been evaluated by the National Commission for the Incorporation of Technologies into SUS (Conitec).

1.4 Insertion of technology in national clinical protocols

The practice of yoga is not mentioned in national clinical protocols, such as the Clinical Protocol and Therapeutic Guidelines for Chronic Pain, and in no other document that refers to practices related to chronic or acute pain.

2. Research question

How effective is yoga for treating acute or chronic pain in an adult population?

P: adult population with acute or chronic pain

I: yoga

C: usual treatment, placebo or no treatment

O: reduction or control of acute or chronic pain

S: systematic reviews

3. Methods
3.1 Inclusion and exclusion criteria

Systematic reviews (SR), with or without meta-analysis, published in English, Spanish and Portuguese, that assess yoga in the treatment of chronic and acute pain in the adult and/or elderly population will be included. There will be no restriction on the year of publication. Overviews, scoping review, integrative review, synthesis of evidence for policies, health technology assessment studies, economic assessment studies, and primary studies in languages other than those mentioned above will not be included.

3.2 Databases and search strategies

Searches for systematic reviews will be carried out on the indexed databases of Pubmed, HSE - Health Systems Evidence, Epistemonikos, VHL Regional Portal, HE - Health Evidence and Embase. The search strategies used will be developed based on the combination of keywords structured from the acronym PICOS, using the terms MeSH in Pubmed and DeCS in the VHL, adapting them to the HSE, Epistemonikos, HE and Embase (Table 1).

<table>
<thead>
<tr>
<th>Base</th>
<th>Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pubmed</td>
<td>“yoga”, “acute pain”, “chronic pain”</td>
</tr>
<tr>
<td>VHL</td>
<td>“ioga”, “yoga”, “acute pain”, “dor aguda”, “dolor agudo”</td>
</tr>
<tr>
<td>HSE</td>
<td>“yoga”</td>
</tr>
<tr>
<td>Epistemonikos</td>
<td>&quot;yoga&quot;, &quot;chronic pain&quot;, &quot;acute pain&quot;</td>
</tr>
<tr>
<td>VHL</td>
<td>“ioga”, “yoga”, “dor crônica”, “chronic pain”, “dolor crónico”</td>
</tr>
<tr>
<td>HE</td>
<td>“yoga”</td>
</tr>
<tr>
<td>EMBASE</td>
<td>“yoga”</td>
</tr>
</tbody>
</table>

3.3 Shortcuts for rapid review

As this is a rapid review, the selection processes for systematic reviews, assessment of methodological quality and data extraction of the selected studies will not be carried out in duplicate.

3.4 Data extraction and analysis

Through a spreadsheet, data related to the author, year, study objective, intervention, comparators, results, limitations, conflict of interest and last year of the search will be extracted. To assess the methodological quality of the articles included, the AMSTAR 2 tool will be used, and the scores obtained will also integrate the extraction worksheet.

4. References


5. Identification of those responsible for the elaboration

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Researcher on Public Health, Fiocruz Brasília
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### Supplementary file 2. Search strategy

<table>
<thead>
<tr>
<th>Source</th>
<th>Date</th>
<th>Query</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pubmed</td>
<td>27/09/2019</td>
<td>(&quot;Yoga&quot;[Mesh]) AND (&quot;Acute Pain&quot;[Mesh] OR Acute Pains OR Pain, Acute OR Pains, Acute)</td>
<td>8</td>
</tr>
<tr>
<td>Pubmed</td>
<td>27/09/2019</td>
<td>(&quot;Yoga&quot;[Mesh]) AND (&quot;Chronic Pain&quot;[Mesh] OR Chronic Pains OR Pains, Chronic OR Pain, Chronic OR Widespread Chronic Pain OR Chronic Pain, Widespread OR Chronic Pains, Widespread OR Chronic Pain, Widespread Chronic OR Chronic Pains)</td>
<td>145</td>
</tr>
<tr>
<td>VHL</td>
<td>27/09/2019</td>
<td>(ioga OR yoga) AND (&quot;acute pain&quot; OR &quot;Dor Aguda&quot; OR &quot;Dolor Agudo&quot;)</td>
<td>341</td>
</tr>
<tr>
<td>VHL</td>
<td>27/09/2019</td>
<td>(ioga OR yoga) AND (&quot;Dor Crônica&quot; OR &quot;Chronic Pain&quot; OR &quot;Dolor Crónico&quot;)</td>
<td>68</td>
</tr>
<tr>
<td>HSE</td>
<td>27/09/2019</td>
<td>Yoga</td>
<td>5</td>
</tr>
<tr>
<td>Epistemonikos</td>
<td>27/09/2019</td>
<td>yoga AND &quot;acute pain&quot;</td>
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</tr>
<tr>
<td>Epistemonikos</td>
<td>27/09/2019</td>
<td>Yoga AND &quot;chronic pain&quot;</td>
<td>22</td>
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<tr>
<td>HE</td>
<td>27/09/2019</td>
<td>Yoga</td>
<td>5</td>
</tr>
<tr>
<td>EMBASE</td>
<td>27/09/2019</td>
<td>'yoga' AND [embase]/lim AND 'systematic review (topic)'/de</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>693</strong></td>
</tr>
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**Supplementary file 3. Included systematic reviews**

Acronyms: RCT - randomized controlled trial.

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Objective # included studies</th>
<th>Population</th>
<th>Intervention Comparator</th>
<th>Results</th>
<th>AMSTAR 2 overall confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cramer et al., 2013</td>
<td>To systematically review and meta-analyze the effectiveness of yoga for low back pain.</td>
<td>10 RCTs, all on yoga</td>
<td>TYPE OF YOGA: Integrated approach to yoga therapy (1); Iyengar yoga (3); Hatha yoga (2); Viniyoga (2); not reported (2). Recommended for regular yoga practice at home + booklets + CD + practice manual + usual care. DURATION OF SESSION, FREQUENCY AND/OR DOSAGE: varied from 30 min to 60 min, between 3 to 24 weeks, with yoga sessions held weekly, once or twice a week. TYPE OF CONTROL: Usual care (2); education (7); self-directed standard medical care (1).</td>
<td>Low back pain A meta-analysis (6 trials, 584 participants) showed evidence in favor of yoga in reducing low back pain in the short and long term. Small magnitude effect. Back-specific disability A meta-analysis (8 trials, 689 participants) showed evidence in favor of yoga in reducing short and long-term back-specific disability. It had a small magnitude effect. Quality of life The results did not show statistical significance for improving health-related quality of life. Adverse events Yoga was not associated with serious adverse events.</td>
<td>Low</td>
</tr>
<tr>
<td>Cramer et al., 2017</td>
<td>To systematically assess and meta-analyze the effectiveness of yoga in relieving chronic neck pain.</td>
<td>3 RCTs, all on yoga</td>
<td>TYPE OF YOGA: Iyengar Yoga (physical postures) (2); yogic mind sound resonance technique (meditation) + physiotherapy (1). DURATION OF SESSION, FREQUENCY AND/OR DOSAGE: Iyengar yoga - Weekly 90 minutes sessions during 9 weeks. Yogic mind sound resonance technique - Daily 20 minutes sessions plus 30 minutes physiotherapy sessions, during 10</td>
<td>Chronic neck pain The meta-analysis revealed evidence of short-term effects for yoga, in comparison with usual care, on the intensity of neck pain and neck pain-related disability. Quality of life and mood There was also an improvement in quality of life and mood, related to improvement in pain. Adverse events Two trials reported adverse events, none severe.</td>
<td>Low</td>
</tr>
</tbody>
</table>
India (1).

TYPE OF CONTROL: Usual care plus self-care manual for 9 weeks (2), 20 minutes of daily supine rest plus 30 minutes of physiotherapy for 10 days (1).

<table>
<thead>
<tr>
<th>Langhorst et al., 2013</th>
<th>To conduct a systematic review with meta-analysis of the efficacy and safety of meditative movement therapies (Qigong, Tai Chi and Yoga) in fibromyalgia syndrome.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAMPLE: Total not informed. In yoga studies, 83 participants (one of the studies did not declare the number of participants).</td>
<td></td>
</tr>
<tr>
<td>COUNTRIES WHERE THE STUDIES WERE CONDUCTED: Brazil (1), Spain (1), United States (3), Sweden (2).</td>
<td></td>
</tr>
<tr>
<td>TYPE OF YOGA: Yoga of Awareness (yoga + meditation + breathing exercises + group discussion) + DVD + home practice (1); yoga breathing exercises in warm water (1).</td>
<td></td>
</tr>
<tr>
<td>DURATION OF SESSION, FREQUENCY AND/OR DOSAGE: Yoga of Awareness - Weekly 120 minutes group class during 8 weeks, totaling 16 hours of intervention. Additional 20 to 40 minutes daily home training, by DVD, performed once a week for 8 weeks. Yoga breathing exercises in warm water - 60 minutes sessions, 4 times a week, during 4 weeks. Total of 16 hours of intervention.</td>
<td></td>
</tr>
<tr>
<td>TYPE OF CONTROL: Delayed treatment control (1); usual treatment (1).</td>
<td></td>
</tr>
</tbody>
</table>

Pain related to fibromyalgia syndrome

Yoga as a meditative therapy with movement, in the analysis of subgroups (2 trials, 88 participants) had beneficial effects in reducing pain related to fibromyalgia.

Quality of life and mood

It had a significant effect on health-related quality of life and depression (1 trial, 53 participants) at the end of treatment.

Adverse events

No serious adverse events were reported.

Moderate

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<table>
<thead>
<tr>
<th>Study</th>
<th>Objective</th>
<th>Population</th>
<th>Sample Size</th>
<th>Conditions</th>
<th>Type of Yoga</th>
<th>Duration of Session, Frequency and/or Dosage</th>
<th>Type of Control</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lee et al., 2014</td>
<td>To examine the quantity and quality of research on self-care movement therapies and determine the evidence for their efficacy and safety in the treatment of chronic pain symptoms (i.e., severity/intensity of pain).</td>
<td>30 RCTs, 13 on yoga.</td>
<td>Population of yoga studies: 1150.</td>
<td>Patients with chronic low back pain, fibromyalgia, migraine, osteoarthritis, carpal tunnel syndrome or irritable bowel syndrome.</td>
<td>Not informed.</td>
<td>There was a wide variety of yoga dosages, ranging from 1 to 72 hours, in periods that varied from 1 day to 24 weeks; one study did not report the dosage.</td>
<td>Exercise and self-care book (1); wait list control (2); usual care/standard medical care (4); physical movements plus non-yogic breathing (1); educational self-care group (1); stretching plus self-care book (1); no treatment (1); education control (1); standard care plus use of wrist splint (1).</td>
<td>Chronic low back pain, fibromyalgia and osteoarthritis No meta-analysis was performed. Five studies reported that yoga, in comparison with a passive control condition, proved to be more effective in reducing chronic symptoms of low back pain and pain associated with fibromyalgia. One study demonstrated that both yoga and a stretching program were equally more efficient in reducing chronic low back pain than a self-care group. Two low quality studies showed that yoga was most efficient in reducing osteoarthritis pain and chronic lower back pain when compared to, respectively, no treatment and one educational group. Only one study found that neither yoga nor usual care was effective in lowering chronic lower back pain symptoms. Pain in carpal tunnel syndrome A low quality study found that an intervention based on yoga plus standard care, together with the use of a splint on the wrist, were equally effective in the treatment of pain in carpal tunnel syndrome. Pain in irritable bowel syndrome One study reported that yoga was not an effective option for treating pain in irritable bowel syndrome. Adverse events</td>
</tr>
<tr>
<td>Li et al., 2019</td>
<td>To quantify the efficacy of yoga for treating chronic nonspecific neck pain.</td>
<td>10 studies: 2 quasi-randomized</td>
<td>SAMPLE: 686 patients with chronic neck pain.</td>
<td>TYPE OF YOGA: Yogasanas (1), Kundalini yoga (1), Hatha yoga (1), iyengar yoga (1), or not specified (4), yogic mind sound resonance technique + physiotherapy (1), Jyoti meditation (1).</td>
<td>Intensity of cervical pain</td>
<td>In the subgroup analysis of the meta-analysis of yoga compared to exercises (9 studies, 488 participants) there was a significant difference in favor of yoga. The effects of the comparison between the yoga and pilates groups were not significant, as well as critically low.</td>
<td></td>
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</tr>
</tbody>
</table>
clinical trials and 8 RCTs, all on yoga. Germany (3), China (1), Korea (1) United States (1), India (1), Sweden (1), Turkey (1).

FREQUENCY AND/OR DOSAGE: The duration of interventions ranged from 10 days to 12 weeks.

TYPE OF CONTROL: Pilates plus isometric exercise (1); pilates plus tai chi and isometric exercise (1); exercise (3); strength training plus evidence-based counseling (1); pilates plus exercise (1) only home-based exercise (1); warm acupuncture (1); physiotherapy plus non-guided supine rest (1).

as yoga compared to complementary and alternative medicine.

Disability related to cervical pain
In the subgroup analysis of the meta-analysis of yoga compared to exercises (7 studies, 363 participants) there was a significant difference in favor of yoga. There was no significant difference in the comparison between yoga and pilates, as well as between yoga and complementary and alternative medicines.

Quality of life and mood
There was an improvement in quality of life (3 trials, 434 participants), but there was no significant difference in physical quality of life analyzed in the subgroup (3 trials, 217 participants). There was also an improvement in mood found between yoga and exercise (4 trials, 351 participants).

Morone; Greco, 2007 To evaluate the viability, safety, and evidence for pain reduction in older adults with chronic non-malignant pain in the following mind-body therapies: biofeedback, progressive muscle relaxation, meditation, guided imagery, hypnosis, tai chi, qi gong and yoga.

SAMPLE: 188 participants aged 50 years and over, 2 studies with people aged ≥ 65 years and 6 studies with people under 50 years old.

COUNTRIES WHERE THE STUDIES WERE CONDUCTED: Not informed.

TYPE OF YOGA: Yoga (3); yoga + relaxation + education (1).

DURATION OF SESSION, FREQUENCY AND/OR DOSAGE: Intervention period/dosage was not specified or varied between 8 and 12 sessions.

TYPE OF CONTROL: Wait-list (1); not specified (1); exercise sessions and self-care book (1); usual care sessions plus wrist splint (1).

Pain in osteoarthritis
No meta-analysis was performed. The results were presented in a narrative form and showed evidence that yoga is safe and can reduce pain in older adults. A study (11 participants) showed improvement in pain and physical function measures in the WOMAC Osteoarthritis Index (Western Ontario and McMaster Universities). Another study on pain in osteoarthritis (26 participants) showed improvement in joint sensitivity and hand pain during yoga activity. Three studies on low back pain showed that yoga improves pain, an effect that can persist for up to 3 months.

Quality of life and mood
Significant changes were found in the quality of life measures.
<table>
<thead>
<tr>
<th>Study</th>
<th>Objective</th>
<th>Sample Size</th>
<th>Country</th>
<th>Treatment Type</th>
<th>Duration of Session, Frequency, Dosage</th>
<th>Control Type</th>
<th>Outcome Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skelly et al., 2018</td>
<td>To assess which noninvasive nonpharmacological treatments for common chronic pain conditions improve function and pain for at least 1 month after treatment.</td>
<td>60 to 313 (total sample = 1466)</td>
<td>United States (5), United Kingdom (1), India (1)</td>
<td>Iyengar yoga (4); Viniyoga (2); Hatha yoga (2). Recommended for regular yoga practice at home + booklets + CD + DVD + practice manual + usual care.</td>
<td>The duration of yoga therapy varied between studies from 4 to 24 weeks and the number of sessions, from 4 to 48.</td>
<td>Exercise (4), wait-list or usual care (2), attention control (education) (5).</td>
<td>Chronic low back pain Meta-analysis showed a favorable result for yoga in pain control, when compared to attention control or wait list, in short (5 trials) and medium term (2 trials). Yoga compared to exercise showed no statistically significant differences in short-term pain. Quality of life When comparing yoga to an attention control, there was no difference in quality of life results. Adverse Events One study reported a case of cellulite in a patient who participated in the yoga intervention.</td>
</tr>
<tr>
<td>Slade et al., 2007</td>
<td>To determine the effect of exercises to facilitate movements without load on the results of people with chronic non-specific low back pain.</td>
<td>830</td>
<td>Not informed.</td>
<td>Viniyoga (1); iyengar yoga + lectures; handouts + newsletters + home program (1).</td>
<td>Not informed.</td>
<td>Aerobic and trunk strengthening or without exercises (1); no exercises plus educational booklet (1).</td>
<td>Nonspecific chronic low back pain Meta-analysis (2 trials, 88 participants) showed that low yoga, when compared to education/self-care and no exercise, had an effect of great magnitude in medium term (26 to 32 weeks) to control pain, as well as to improve back function.</td>
</tr>
<tr>
<td>Ward et al., 2013</td>
<td>To examine the effectiveness of yoga on primary outcomes of functional capacity, pain and psychosocial outcomes in musculoskeletal conditions.</td>
<td>SAMPLE: 1626 patients with clinically diagnosed musculoskeletal condition.</td>
<td>TYPE OF YOGA: Yoga of Awareness (1), Iyengar/Hatha (2), IYT: integrated yoga therapy (1), Hatha (3), Iyengar-based (1), Iyengar (3), Viniyoga (2), IAYT:integrated approach to yoga therapy (2), not reported (2). Ten studies engaged home practice as a component of yogic intervention, providing written instructions, yoga props and audiovisual aids (CD or DVD).</td>
<td>Pain in osteoarthritis</td>
<td>Two primary studies (276 participants), with a high risk of bias, showed results in favor of yoga compared to therapeutic exercises or usual care.</td>
<td>Critically low</td>
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<tr>
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</tr>
<tr>
<td>Low back pain</td>
<td>Four studies on low back pain were included in the meta-analysis. There was a moderate overall effect in favor of yoga interventions.</td>
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<tr>
<td>Functionality in low back pain and fibromyalgia</td>
<td>Eight studies were included in the meta-analysis. There was a moderate effect in favor of yoga.</td>
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</tr>
<tr>
<td>Quality of life and mood</td>
<td>Positive results of quality of life and mood were found in mild to moderate low back pain groups.</td>
<td>---</td>
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<tr>
<td>Adverse events</td>
<td>A herniated disc was reported as a serious adverse effect potentially associated with yoga. Also, increased low back pain has been reported in some patients.</td>
<td>---</td>
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<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wieland et al., 2017</th>
<th>To evaluate the effects of yoga in the treatment of chronic non-specific low back pain, in comparison to no specific treatment.</th>
<th>SAMPLE: 1080 adults with chronic non-specific low back pain.</th>
<th>TYPE OF YOGA: Iyengar yoga (5), Iyengar-based yoga (1), Hatha yoga (2), Viniyoga (2), not specified (2). All interventions included meditation, relaxation or breathing exercises, in addition to physical yoga poses.</th>
<th>Specific back function</th>
<th>A meta-analysis showed favorable results for yoga in comparison to no exercise in the period of 4 to 6 weeks, 3 to 4 months (7 trials; 667 participants; evidence of low confidence), at 6 months (6 trials; 630 participants; evidence of moderate confidence), and at 12 months (2 trials; 365 participants; evidence of low confidence). There was no</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low back pain</td>
<td>Four studies on low back pain were included in the meta-analysis. There was a moderate overall effect in favor of yoga interventions.</td>
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</tr>
</tbody>
</table>
a minimal intervention (e.g. education), or other active treatment, focusing on pain, function and adverse events.

12 RCTs, all on yoga.

STUDIES WERE CONDUCTED: United States (7), India (3) and the United Kingdom (2).

FREQUENCY AND/OR DOSAGE: For all studies except one, the yoga intervention consisted of one to three yoga classes per week, each class lasting from 45 to 90 minutes. For the remaining study, the yoga group practiced about two hours of yoga postures a day, as well as meditation, breathing, and chanting, and were given lectures on yogic lifestyle. Some studies, in combination with yoga, carried out other interventions: receiving a booklet and usual care (2), usual care (3), usual medical care and usual medications, plus receiving a book about back pain (1), access to medical care (2).

TYPE OF CONTROL: Usual care plus receiving a booklet containing information about handling low back pain (1); no treatment (1); waiting list plus receiving an educational booklet about back pain (1); individually prescribed exercises (1); usual care (3); exercise classes or receiving a evidence-based book with information about self-care strategies (1); exercise classes or receiving a book about back pain (1); intensive one week residential programme of non-yogic physical exercises (1); occupational therapy sessions (1); receiving weekly newsletters about back care (1).

statistically significant difference in the comparison between yoga and exercises regarding back-related function.

**Low back pain**
A meta-analysis showed results in favor of yoga when it was compared to no exercise in the periods of 4 to 6 weeks (2 trials, 40 participants; evidence of very low confidence), 3 to 4 months (5 trials, 458 participants; evidence of moderate confidence), and at 6 months (4 trials, 414 participants; evidence of low confidence). At 12 months the results showed no statistically significant differences (2 trials; 355 participants; evidence of low confidence). The results indicated a favorable response to yoga in comparison to exercise at 1 week (1 trial; 80 participants), 4 weeks (1 trial; 54 participants), and 7 months (1 trial; 54 participants). The evidence is considered to be of very low confidence due to a very serious risk of bias and imprecision.

**Clinical improvement**
A meta-analysis showed favorable results for yoga when compared to no exercise in 4 to 6 weeks (2 trials, 141 participants; evidence of low confidence), at 3 months (3 trials, 168 participants; evidence of low confidence), and 6 months (1 trial, 128 participants; evidence of low confidence). There was no statistically significant differences regarding clinical improvement in the comparison between yoga and exercise.

**Quality of life and mood**
There was an improvement in the quality of life and mood in the practice of yoga compared to other interventions, however the methodological quality of the studies was considered low.

**Adverse events**
Some studies reported adverse events, but the link between adverse events and yoga was not consistently evaluated. A meta-analysis (6 trials; 696 participants; evidence of moderate confidence) showed that people who practiced yoga had greater risk of adverse events than those in non-yoga groups. There were no statistically significant differences in the comparison between yoga and exercise regarding adverse events. Three studies did not inform the existence or the absence of adverse events.