Systematic Review on Noninvasive Nonpharmacological Treatment for Chronic Pain: Surveillance Report 3

Literature Update Period: January 2021 through March 2022

Background and Purpose

This is the third and final update for the 2020 report *Noninvasive Nonpharmacological Treatment for Chronic Pain*[1] (available at https://effectivehealthcare.ahrq.gov/products/noninvasive-nonpharm-pain-update/research), covering the period January 2021 through March 2022. The 2020 report addressed benefits and harms of noninvasive nonpharmacological therapy for five common chronic pain conditions: low back pain (LBP); neck pain; knee, hip, or hand osteoarthritis (OA); fibromyalgia (FM); and tension headache. Given the clinical and public health importance of this topic, it is important to identify new evidence that could impact practice or policy. The purpose of this surveillance report is to identify new evidence published after December 2021 and to determine how the new evidence impacts findings of the 2020 report and Surveillance Reports 1 and 2, which added evidence from August 2019 through December 2021 and were published on the Agency for Healthcare Research and Quality (AHRQ) website (available at https://effectivehealthcare.ahrq.gov/products/noninvasive-nonpharm-pain-update/research). This is the final surveillance update planned for this topic.

Scope

The scope and eligibility criteria established at the time of the original report[1] were utilized for this surveillance report; no changes were made. That report included randomized controlled trials (RCTs) reporting outcomes at least 1 month following the completion of treatment and focused on the use of single, active, noninvasive nonpharmacological interventions (including exercise, mind-body practices, psychological therapies, mindfulness practices, manual therapies, physical modalities, acupuncture, and multidisciplinary rehabilitation) for adults with five common chronic pain conditions, LBP (Key Question 1), neck pain (Key Question 2), knee, hip, or hand OA (Key Question 3), FM (Key Question 4), and tension headache (Key Question 5). The report addressed:

- Whether the interventions work overall compared with sham, waitlist control, attention control, no treatment, or usual care.
- Whether the interventions work compared with pharmacological alternatives.
- How outcomes for individual interventions (e.g., acupuncture) compare with a common comparator (exercise for LBP, neck pain, OA, and FM; biofeedback for headache).

Agency for Healthcare Research and Quality

In addition, Key Question 6 addressed whether estimates of benefits and harms differ by age, sex, presence of comorbidities (e.g., emotional or mood disorders), or degree of nociplasticity/central sensitization.

The full protocol for the original report, including detailed inclusion criteria using the PICOTS framework (https://www.ncbi.nlm.nih.gov/books/NBK556223/table/ch3.tab1/?report=objectonly) and full Key Questions (https://www.ncbi.nlm.nih.gov/books/n/cer227/ch2/#ch2.s2), is available on the AHRQ website (https://effectivehealthcare.ahrq.gov/products/noninvasive-nonpharm-pain-update/protocol) and on the PROSPERO systematic reviews registry (CRD42019132457).

Methods

Update searches were conducted to identify evidence published from January 2021 through March 2022. Search strategies from the original report were utilized,[1] and we searched the same databases as in the original report (Ovid® MEDLINE®, Cochrane Central Register of Controlled Trials, and Cochrane Database of Systematic Reviews). In addition, to capture articles not yet indexed in MEDLINE, we supplemented the original search strategies with a previously developed[2] optimized (text-word only) search in pre-MEDLINE to identify studies not yet indexed with Medical Subject Headings (MeSH). As in the original report, searches on electronic databases were supplemented by review of reference lists of relevant articles. Search strategies are available in Appendix A.

As in the original review, one investigator screened citations identified through searches for eligibility for full-text review. (Key Questions and inclusion criteria are available in Appendix B.) In addition, a second investigator utilized a machine learning classifier to assist in the screening. The machine learning classifier screened all citations; the second investigator reviewed all studies that the machine learning classifier did not classify as very low probability of inclusion. The machine learning classifier was previously shown to have 100 percent recall for identifying eligible studies in update searches for this review.[2] Any citation identified as potentially eligible by either of the two investigators underwent full-text review to determine final eligibility.

We utilized the same methods for data abstraction and quality assessment as for the original report. As in the prior review, we assessed the risk of bias of RCTs using the approaches recommended in the *Cochrane Handbook for Systematic Reviews of Interventions* (Chapter 8.5, Risk of Bias Tool)[3] and the AHRQ *Methods Guide for Effectiveness and Comparative Effectiveness Research*,[4] in conjunction with criteria and methods developed by the Cochrane Back and Neck Group.[5] Studies with at least 1 month of followup were included, and results were stratified according to short-term (1 to <6 months), intermediate term (6 to <12 months), and long-term (≥12 months) followup. We also classified the magnitude of effects for pain and function using the same approach as the original report. A small effect was defined for pain as a mean between-group difference following treatment of 0.5 to 1.0 points on a 0- to 10-point numeric rating scale or visual analog scale (VAS) and for function as a standardized mean difference (SMD) of 0.2 to 0.5 or a mean difference of 5 to 10 points on the 0 to 100-point Oswestry Disability Index (ODI), 1 to 2 points on the 0 to 24-point Roland-Morris Disability Questionnaire (RDQ), or equivalent. A moderate effect was defined for pain as a mean difference of 10 to 20 points on a 0- to 100-point VAS and for function as an SMD of 0.5 to 0.8, or a mean difference of 10 to 20 points on the ODI, 2 to 5 points on the RDQ, or equivalent. Large/substantial effects were defined as greater than moderate.

New data identified from surveillance were incorporated into the relevant meta-analyses from the original 2020 report when they were suitable for pooling and re-analyzed to provide updated estimates. We also ran new meta-analyses when data permitted. The strength of evidence (SOE) was based on the totality of evidence (evidence in the original report plus new evidence) and determined using the methods described in the original report. We noted any changes in the SOE assessments.

A comprehensive list of included studies identified for all three surveillance report periods is provided in Appendix C. An evidence table providing data from these included studies is available in Appendix D, and quality assessments for each of these studies are shown in Appendix E. A list of articles excluded at full-text review, along with reasons for exclusion, is available in Appendix F. Updated and new meta-analyses can be found in Appendix G and updated strength of evidence tables for outcomes with new evidence are available in Appendix H.

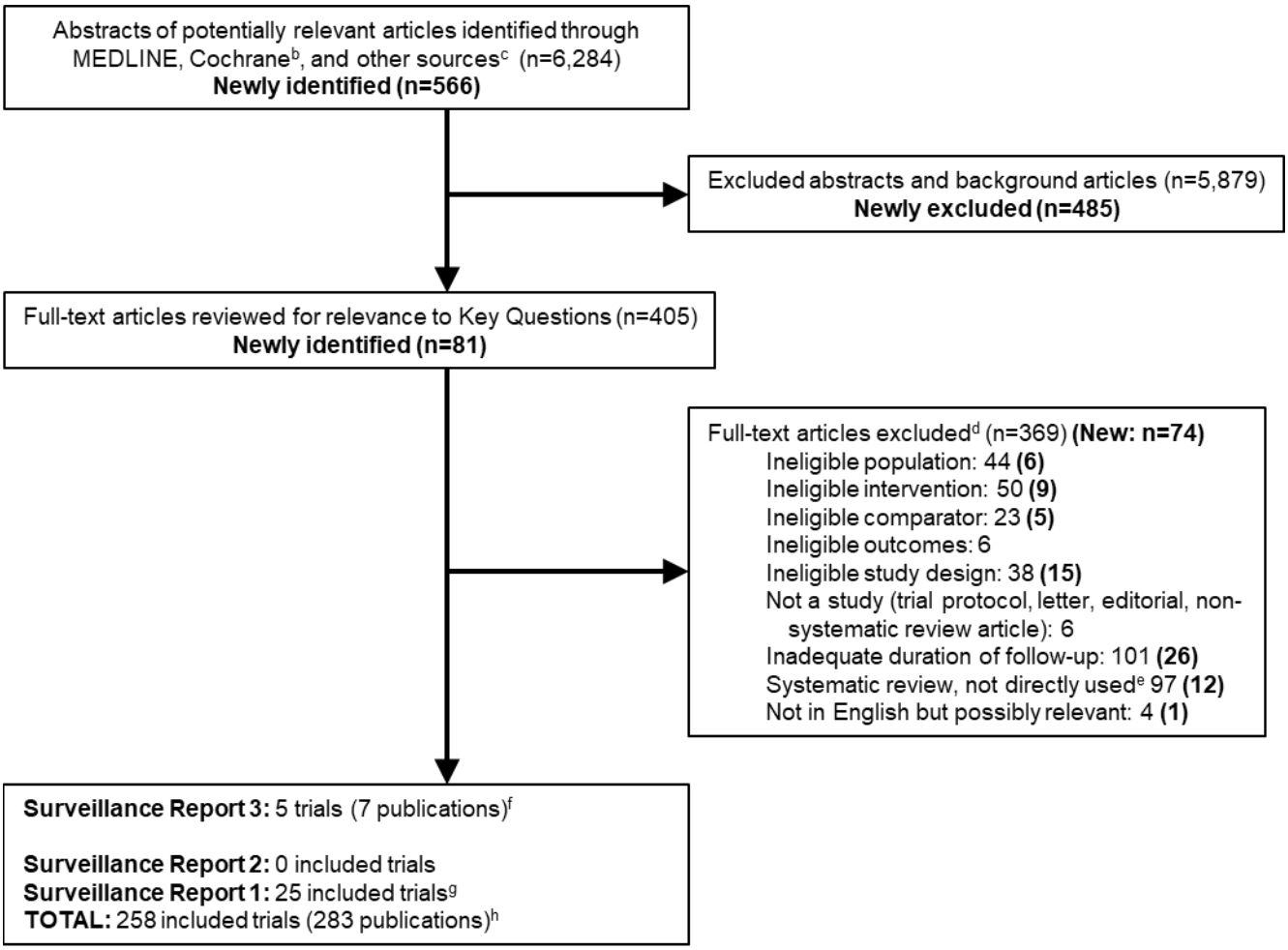
Results

The search for Surveillance Report 3 yielded 566 citations; of these, five new trials (2 LBP, 3 knee OA)[6-10] and one subsequent publication to a trial (FM)[11] already included in Surveillance Report 1 that reported additional primary outcomes of interest met inclusion criteria (Figure 1). In addition, one subsequent publication for a trial already included in the 2020 report was identified and reported only secondary outcomes.[12] This surveillance report focuses on the primary outcomes and changes in SOE based on new evidence. Secondary outcomes are not summarized in this update report but can be found in Appendix D of this report and Appendix D of the original report.

For **chronic LBP**, two new RCTs (both fair quality) were included that compared exercise versus usual care (1 RCT)[10] and psychological therapy versus usual care (1 RCT)[8]. For **knee OA**, a total of three new RCTs (1 good, 1 fair, and 1 poor quality) were included that compared transcutaneous electrical stimulation (TENS) versus sham TENS (1 RCT)[7] and mind-body practices (yoga and Qigong) versus usual care or attention control (2 RCTs).[6,9] For **FM**, one subsequent publication to a trial already summarized in Surveillance Report 1 was included; it had three arms, and compared exercise and acupuncture versus no treatment and acupuncture versus exercise.[11]

No new trials were identified for neck pain, hip or hand OA, or chronic tension–type headache or that compared a nonpharmacological therapy with pharmacological therapy. No trials in pregnant or breastfeeding women with pre-existing chronic pain were identified (all Key Questions). No data were available to evaluate nociplasticity as a modifier to treatment effectiveness or safety (Key Question 6).

Figure 1. Literature flow diagram[a]



[a] Search counts are for the update searches only, and the included studies total is from the original report and surveillance reports combined.
[b] Cochrane databases include the Cochrane Central Register of Controlled Trials and the Cochrane Database of Systematic Reviews.
[c] Other sources include prior reports, reference lists of relevant articles, systematic reviews, etc.
[d] Publications may be included or excluded for multiple interventions.
[e] Used as source documents, studies checked for inclusion eligibility.
[f] 1 followup publication, Garrido-Ardila 2021 (to Garrido-Ardila 2020 [FM] identified in Surveillance Report 1) provided new evidence on primary outcomes (function and pain) and is summarized in this report. Another subsequent publication, Marshall 2021 (to Saper 2017 [chronic low back pain] included in the 2020 report) reported only secondary outcomes of interest and is not summarized in this surveillance report, but details can be found in Appendix D.
[g] The 4 followup publications identified in Surveillance Report 1 that reported only secondary outcomes are not counted in the number of included trials but are counted under total publications.
[h] A total of 228 trials (in 247 publications) were included in the 2020 report.

Summary of Findings

- Five new RCTs and one subsequent publication to a trial included in Surveillance Report 1 that reported on primary outcomes of interest were identified for this update (2 in chronic LBP, 3 in knee OA, and 1 in FM). Two of the new trials in knee OA evaluated interventions (chair yoga) or timepoints not previously evaluated; otherwise, the trials evaluated interventions and comparators with at least some prior evidence.

Chronic Low Back Pain

- **Exercise:** The addition of one new fair-quality trial identified for Surveillance Report 3 comparing exercise (Pilates) with usual care did not change the 2020 report's conclusions of a small improvement in *function* (SOE: moderate) and a moderate improvement in *pain* (SOE: low) at short term based on updated meta-analyses, which also included the two trials identified for Surveillance Report 1.
- **Psychological therapies:** The inclusion of one new fair-quality RCT identified for Surveillance Report 3 comparing rumination-focused CBT versus usual care did not change the 2020 report's conclusion of a small improvement in *pain* (SOE: moderate) at short term based on an updated meta-analysis, which also included one trial identified for Surveillance Report 1.

Knee OA

- **Physical modalities—transcutaneous electrical stimulation:** One new good-quality RCT identified for Surveillance Report 3 compared TENS versus sham TENS and reported short-term outcomes only; the original report did not provide data on short-term outcomes for this comparison. There were no differences between groups in *function* or *pain*. The strength of evidence was low.
- **Mind-body therapies—yoga:** The prior report did not contain evidence for chair yoga versus attention control. Evidence from one new poor-quality RCT identified for Surveillance Report 3 was considered insufficient.
- **Mind-body therapies—Tai Chi and Qigong:** One new small poor-quality RCT was identified for Surveillance Report 3 that compared Qigong with usual care. Updated meta-analyses including this trial and another fair-quality trial from Surveillance Report 1 resulted in upgrading SOE from insufficient to low for a small improvement in function and a moderate improvement in pain at intermediate term for the mind-body therapies Tai Chi or Qigong versus attention control or usual care.

Fibromyalgia

- **Exercise:** One followup publication to a poor-quality trial comparing exercise with usual care that was included in Surveillance Report 1 was identified for Surveillance Report 3. The addition of this new publication does not change the 2020 report's conclusions of a small improvement in *function* (SOE low) and a small improvement in *pain* (SOE moderate) short term based on updated meta-analyses, which also included one trial identified for Surveillance Report 1 for short-term function.

- **Acupuncture**: One followup publication to a poor-quality trial comparing acupuncture with usual care that was included in Surveillance Report 1 was identified for Surveillance Report 3. This new publication provided short-term data for the primary outcomes of function (Fibromyalgia Impact Questionnaire [FIQ] total score) and pain (VAS pain) not reported previously, which allowed us to pool these data with trials included in the 2020 report. (There were 3 trials vs. sham acupuncture.) The addition of this new publication does not change the 2020 report's conclusions of a small improvement in *function* (SOE moderate) and no difference in *pain* (SOE low) with acupuncture versus usual care or sham at short term. The prior report did not contain evidence for acupuncture versus exercise. Evidence from this same followup publication to the poor-quality RCT included in Surveillance Report 1, identified for Surveillance Report 3, was considered insufficient.

Harms

- Consistent with the 2020 report, adverse events were not consistently reported in new studies identified for the surveillance reports, and intervention-related serious life-threatening events requiring medical attention were not reported.

Summary of New Evidence

Table 1 provides the conclusions from the 2020 report and the new findings from studies identified in this and the prior surveillance update reports; areas with new evidence from this Surveillance Report 3 are indicated in the table.. Table 1 focuses on Key Questions with new evidence since the original report. For completeness, the original table of harms from the 2020 report (Table 2) was updated with harms reported in this and the prior surveillance update reports; areas with new evidence from Surveillance Report 3 are indicated by bolded and italicized text in this table as well. The full SOE table is available in the full report (https://www.ncbi.nlm.nih.gov/books/n/cer227/appg/), and a table showing complete SOE ratings updated for areas with new evidence is shown in Appendix H.

Table 1. Summary of conclusions and assessments informed by new evidence

Condition: Intervention, Comparator	Outcome, Timing[a]	Conclusions From 2020 Report[b]	Findings From Surveillance[b]	Assessment
LBP: Exercise vs. UC, AC or placebo	***Function, short term***	***Small improvement SOE: Moderate 10 RCTs (N=940) [Excluding an outlier trial]***	***1 fair-quality RCT (N=39)[10] new for SR 3 and 2 fair-quality RCTs (N=147)[13,14] from SR 1 MA updated for SR 3 13 RCTs (N=1,126)***	***No change in conclusions***
	Function, intermediate term	No difference SOE: Low 5 RCTs (N=616)	1 fair-quality RCT (N=96)[13] from SR 1 MA updated 6 RCTs (N=712)	Small improvement SOE: Low

Condition: Intervention, Comparator	Outcome, Timing[a]	Conclusions From 2020 Report[b]	Findings From Surveillance[b]	Assessment
	Pain, short term	***Moderate improvement SOE: Low 11 RCTs (N=981)***	***1 fair-quality RCT (N=39)[10] new for SR 3 and 1 fair-quality RCT (N=111)[13] from SR 1 MA updated for SR 3 13 RCTs (N=1,131)***	***No change in conclusions***
	Pain, intermediate term	Small improvement SOE: Low 5 RCTs (N=616)	1 fair-quality RCT (N=96)[13] from SR 1 **MA updated for SR 3[c]** 6 RCTs (N=712)	No change in conclusions
LBP: Psychological therapies vs. UC	Function, short term	Small improvement SOE: Moderate 3 RCTs (N=906)	2 fair-quality RCTs (N=146)[14,15] from SR 1 MA updated for SR 1 4 RCTs (N=1,018)[d]	Small improvement SOE: Low (downgraded one level)
	Function, intermediate term	Small improvement SOE: Moderate 3 RCTs (N=1,026)	1 fair-quality RCT (N=116)[15] from SR 1 MA updated for SR 1 4 RCTs (N=1,142)	No change in conclusions
	Function, long term	Small improvement SOE: Moderate 3 RCTs (N=815)	1 fair-quality RCT (N=124)[15] from SR 1 MA updated for SR 1 4 RCTs (N=939)	No change in conclusions
	Pain, short term	***Small improvement SOE: Moderate 3 RCTs (N=906)***	***1 fair-quality RCT (N=30)[8] new for SR 3 and 1 fair-quality RCT (N=112)[15] from SR 1 MA updated for SR 3 5 RCTs (N=1,048)***	***No change in conclusions***
	Pain, intermediate term	Small improvement SOE: Moderate 3 RCTs (N=1,026)	1 fair-quality RCT (N=116)[15] from SR 1 **MA updated for SR 3[c]** 4 RCTs (N=1,142)	No change in conclusions
	Pain, long term	Small improvement SOE: Moderate 3 RCTs (N=815)	1 fair-quality RCT (N=124)[15] from SR 1 **MA updated for SR 3[c]** 4 RCTs (N=940)	No change in conclusions
LBP: Psychological therapies vs. exercise	Function, short term	No evidence at short term	1 fair-quality RCT (N=34)[14] from SR 1	Insufficient evidence
LBP: Physical modalities: LLLT vs. sham	Function, short term	Small improvement SOE: Low 1 RCT (N=56)	1 poor-quality RCT (N=34)[16] from SR 1	No change in conclusions
	Pain, short term	Moderate improvement SOE: Low 1 RCT (N=56)	1 poor-quality RCT (N=34)[16] from SR 1	No change in conclusions
LBP: Physical modalities: Burst TENS and continuous TENS vs. sham	Function, short term	No evidence	1 fair-quality RCT (N=73)[17] from SR 1	New intervention No difference SOE: Low
	Pain, short term	No evidence	1 fair-quality RCT (N=73)[17] from SR 1	New intervention No difference SOE: Low

Condition: Intervention, Comparator	Outcome, Timing[a]	Conclusions From 2020 Report[b]	Findings From Surveillance[b]	Assessment
LBP: Manual therapy: Massage vs. sham, UC, AC	Function, short term	Small improvement SOE: Moderate 6 RCTs (N=694)	1 fair-quality RCT (N=59)[18] from SR 1 **MA updated for SR 3[c]** 7 RCTs (N=753)	No change in conclusions
	Pain, short term	Small improvement SOE: Moderate 5 RCTs (N=644)	1 fair-quality RCT (N=59)[18] from SR 1 **MA updated for SR 3[c]** 6 RCTs (N=703)	No change in conclusions
LBP: Manual therapy: Spinal manipulation vs. sham, UC, AC	Function, short term	Small improvement SOE: Low 3 RCTs (N=704)	1 fair-quality RCT (N=153)[19] from SR 1 MA updated for SR 1 4 RCTs (N=857)	No change in conclusions
	Pain, short term	No difference SOE: Low 3 RCTs (N=530)	1 fair-quality RCT (N=153)[19] from SR 1 **MA updated for SR 3[c]** 4 RCTs (N=683)	No change in conclusions
LBP: Mind-body practices: Yoga vs. exercise	Function, short term	No difference SOE: Low 4 RCTs (N=559)	2 fair-quality RCTs (N=252)[20,21] from SR 1 **MA updated for SR 3[c]** 6 RCTs (N=811)	No change in conclusions
	Pain, short term	No difference SOE: Low 5 RCTs (N=575)	2 fair-quality RCTs (N=252)[20,21] from SR 1 **MA updated for SR 3[c]** 7 RCTs (N=827)	No change in conclusions
LBP: Acupuncture vs. sham, UC, or AC	Function, short term	Small improvement SOE: Low 4 RCTs (N=2,066)	1 fair-quality RCT [standard acupuncture arm] (N=98)[22] from SR 1 **MA updated for SR 3[c]** 5 RCTs (N=2,164)	No change in conclusions
	Pain, short term	Small improvement SOE: Moderate 5 RCTs (N=2,109)	1 fair-quality RCT [standard acupuncture arm] (N=98)[22] from SR 1 **MA updated for SR 3[c]** 6 RCTs (N=2,207)	No change in conclusions
Neck pain: Exercise vs. AC, WL, or NT	Function, short term	No difference [excluding outlier] SOE: Low 3 RCTs (N=444)	1 fair-quality RCT (N=43)[23] from SR 1 **MA updated for SR 3[c]** 4 RCTs (N=487)	No change in conclusions
	Pain, short term	No difference [excluding outlier] SOE: Low 3 RCTs (N=444)	1 fair-quality RCT[e] (N=43)[23] from SR 1	No change in conclusions[e]
Neck pain: Manual therapy: Manipulation vs. sham	Function, short term	No evidence	1 fair-quality RCT (N=42)[23] from SR 1	New intervention Moderate improvement SOE: Low
	Pain, short term	No evidence	1 fair-quality RCT (N=42)[23] from SR 1	New intervention Large improvement SOE: Low
Neck pain:	Function, short term	No evidence	1 fair-quality RCT (N=43)[23] from SR 1	New intervention No difference SOE: Low

Condition: Intervention, Comparator	Outcome, Timing[a]	Conclusions From 2020 Report[b]	Findings From Surveillance[b]	Assessment
Manual therapy: Manipulation vs. exercise	Pain, short term	No evidence	1 fair-quality RCT (N=43)[23] from SR 1	New intervention No difference SOE: Low
Knee OA: Exercise vs. UC, AC, sham, or NT	Function, short term	Small improvement SOE: Moderate 8 RCTs (N=748)	1 poor-quality RCT (N=84)[24] from SR 1 MA updated for SR 1 9 RCTs (N=832)	No change in conclusions
	Function, intermediate term	Moderate improvement SOE: Low 11 RCTs (N=879)	1 fair-quality RCT (N=265)[25] from SR 1 MA updated for SR 1 12 RCTs (N=1,144)	No change in conclusions
	Function, long term	Small improvement SOE: Low 4 RCTs (N=1,199)	2 fair-quality RCTs (N=342)[25,26] from SR 1 MA updated for SR 1 6 RCTs (N=1,541)	No change in conclusions
	Pain, short term	Small improvement SOE: Moderate 8 RCTs (N=748)	1 poor-quality RCT (N=84)[24] from SR 1 MA updated for SR 1 9 RCTs (N=832)	No change in conclusions
	Pain, intermediate term	Moderate improvement SOE: Low 11 RCTs (N=879)	1 fair-quality RCT (N=261)[25] from SR 1 MA updated for SR 1 12 RCTs (N=1,140)	No change in conclusions
	Pain, long term	Small improvement SOE: Low 4 RCTs (N=1,199)	2 fair-quality RCTs (N=338)[25,26] from SR 1 MA updated for SR 1 6 RCTs (N=1,537)	No change in conclusions
Knee OA: Physical modalities: TENS vs. sham TENS	***Function and Pain, short term***	***No evidence***	***1 good-quality RCT (N=220)[7] from SR 3***	***New timepoint (short term)*** ***No difference*** ***SOE: Low***
Knee OA: Physical modalities: LLLT vs. sham or UC	Function, short term	Insufficient evidence 1 RCT (N=49)	1 good-quality RCT (N=84)[27] from SR 1 New MA for SR 1 2 RCTs (N=133)	Small improvement SOE: Low (upgraded one level)
	Function, intermediate term	Insufficient evidence 2 RCTs (N=109)	1 good-quality RCT (N=84)[27] from SR 1 New MA for SR 1 3 RCTs (N=193)	Small improvement SOE: Low (upgraded one level)
	Pain, short term	Insufficient evidence 2 RCTs (N=76)	1 good-quality RCT (N=84)[27] from SR 1 MA updated for SR 1 3 RCTs (N=160)	No difference SOE: Low (upgraded one level)
	Pain, intermediate term	Insufficient evidence 2 RCTs (N=109)	1 good-quality RCT (N=84)[27] from SR 1 MA updated for SR 1 3 RCTs (N=193)	No difference SOE: Low (upgraded one level)
Knee OA: Physical modalities:	Function, short term	No difference SOE: Low 3 RCTs (N=249)	1 good-quality RCT (N=75)[28] from SR 1 No difference	No change in conclusions

Condition: Intervention, Comparator	Outcome, Timing[a]	Conclusions From 2020 Report[b]	Findings From Surveillance[b]	Assessment
Continuous and pulsed US vs. sham	Pain, short term	No difference SOE: Low 3 RCTs (N=249)	1 good-quality RCT (N=75)[28] from SR 1 **MA updated for SR 3[c]** 4 RCTs (N=324)	No change in conclusions
Knee OA: Physical modalities: Interferential current vs. sham	Function, short and intermediate term	No evidence	1 good-quality RCT (N=84)[27] from SR 1	New intervention No difference SOE: Low
	Pain, short and intermediate term	No evidence	1 good-quality RCT (N=84)[27] from SR 1	New intervention No difference SOE: Low
Knee OA: Manual therapies: Massage vs. UC	Function, short term	Insufficient evidence 1 RCT (N=125)	1 poor-quality RCT (N=60)[29] from SR 1 No improvement	No change in conclusions
	Pain, short term	Insufficient evidence 1 RCT (N=125)	1 poor-quality RCT (N=60)[29] from SR 1 Small improvement	No change in conclusions
Knee OA: Mind-body therapies: Yoga vs. AC	***Pain, short term***	***No evidence***	***1 poor-quality RCT (N=112)[6] from SR 3 Effect size not calculable***	***New intervention Insufficient evidence***
Knee OA: Mind-body therapies: Tai Chi or Qigong vs. AC or UC	***Function, intermediate term***	***Insufficient evidence 1 RCT (N=40)***	***1 fair-quality RCT (N=266)[9] new for SR 3 and 1 poor-quality RCT (N=92)[30] from SR 1 MA updated for SR 3 2 RCTs [excluding poor-quality] (N=306)***	***Small improvement SOE: Low***
	Pain, intermediate term	***Insufficient evidence 1 RCT (N=40)***	***1 fair-quality RCT (N=266)[9] new for SR 3 and 1 poor-quality RCT (N=92)[30] from SR 1 MA updated for SR 3 2 RCTs [excluding poor-quality] (N=306)[f]***	***Moderate improvement SOE: Low***
Knee OA: Mind-body therapies: Qigong vs. exercise	Function and pain, intermediate term	No evidence vs. exercise	1 fair-quality trial (N=68)[31] from SR 1 No improvement	New comparator Insufficient evidence
Knee OA: Acupuncture vs. UC, NT, or sham	Function, short term	No difference [Excluding outlier] SOE: Low 4 RCTs (N=871)	1 good-quality RCT (N=83)[32] from SR 1 **MA updated for SR 3[c]** 5 RCTs (N=954)	No change in conclusions
	Pain, short term	No difference SOE: Low 6 RCTs (N=1,065)	1 good-quality RCT (N=83)[32] from SR 1 **MA updated for SR 3[c]** 7 RCTs (N=1,148)	No change in conclusions
FM: Exercise vs. UC, NT, sham, or AC	***Function, short term***	***Small improvement SOE: Low 7 RCTs (N=410)***	***1 poor-quality RCT new for SR 3 (N=69)[11] and 1 poor-quality RCT from SR 1 (N=66)[33,34] MA updated for SR 3 9 RCTs (N=545)***	***No change in conclusions***

Condition: Intervention, Comparator	Outcome, Timing[a]	Conclusions From 2020 Report[b]	Findings From Surveillance[b]	Assessment
	Pain, short term	***Small improvement SOE: Moderate 6 RCTs (N=337)***	***1 poor-quality RCT (N=69)[11] new for SR 3 MA updated for SR 3 7 RCTs (N=406)***	***No change in conclusions***
FM: Manual therapy: Spinal manipulation vs. sham	Function, short and intermediate term	No evidence	1 fair-quality RCT (N=101)[35] from SR 1	New intervention No difference SOE: Low
	Pain, short and intermediate term	No evidence	1 fair-quality RCT (N=101)[35] from SR 1	New intervention No difference SOE: Low
FM: Mindfulness practices: MBSR, MAT vs. AC or WL	Function, intermediate term	Small improvement SOE: Low 1 RCT (N=148)	1 poor-quality RCT (N=98)[36] from SR 1 **MA updated for SR 3[c]** 2 RCTs (N=298)	No change in conclusions
FM: Mind-body therapies: BBAT vs. UC	Pain, short and intermediate term	No evidence	1 fair-quality RCT (N=39)[37] from SR 1 No difference	New intervention Insufficient evidence
FM: Acupuncture vs. sham or UC	***Function, short term***	***Small improvement SOE: Moderate 3 RCTs (N=283)***	***1 poor-quality RCT (N=67)[11] new for SR 3 MA updated for SR 3 4 RCTs (N=350)***	***No change in conclusions***
	Pain, short term	***No difference SOE: Low 5 RCTs (N=399)***	***1 poor-quality RCT (N=67)[11] new for SR 3 MA updated for SR 3 6 RCTs (N=466)***	***No change in conclusions***
FM: Acupuncture vs. exercise	***Function and pain, short term***	***No evidence vs. exercise***	***1 poor-quality RCT (N=70)[11] new for SR 3 No difference***	***New comparator Insufficient evidence***
FM: MDR vs. UC or WL	Function, short term	Small improvement SOE: Low 3 RCTs (N=381)	1 poor-quality RCT (N=64)[34] from SR 1 **MA updated for SR 3[c]** 4 RCTs (N=445)	No change in conclusions
FM: MDR vs. exercise	Function, short term	No evidence at short term	1 poor-quality RCT (N=64)[34] from SR 1 No difference	New timepoint (short term) Insufficient evidence

Abbreviations: AC = attention control; BBAT = basic body awareness training; FM = fibromyalgia; LBP = low back pain; LLLT = low-level laser therapy; MA = meta-analysis; MAT = meditation awareness training; MBSR = mindfulness-based stress reduction; MDR = multidisciplinary rehabilitation; NT = no treatment; OA = osteoarthritis; RCT = randomized controlled trial; SOE = strength of evidence; SR = Surveillance Report; TENS = transcutaneous electrical nerve stimulation; UC = usual care; US = ultrasound; vs. = versus; WL = waitlist.

[a] Duration of followup is defined as: short term = 1 to <6 months; intermediate term = 6 to <12 months.

[b] The sample size (N) reported is as analyzed.

[c] No new evidence identified for SR 3, but the MA was updated for SR 3 with evidence from SR 1 for completeness.

[d] One new trial, Shariat 2019, was an outlier and conclusions are based on inclusion of the one new fair-quality RCT (Ashar 2021), which increased heterogeneity, leading to downgrade from moderate to low SOE.

[e] Excluding outlier trial identified in Surveillance Report 1: Bernal-Utera 2020. This trial was small and a huge outlier that increased heterogeneity by 30%.

[f] Poor-quality trial excluded, Hu 2020 – heterogeneity decreased from 80.2% to 37.8%.

Table 2. Overview of reported treatment-related adverse events/harms from trials included in the original 2020 report and the surveillance reports

Intervention	Reported Adverse Events
Exercise vs. usual care, waitlist, no treatment, attention control, sham treatment, acetaminophen, standard analgesics, and anti-inflammatory therapy	***No statistical differences between exercise and any comparator were identified for any condition (including 1 RCT[13] in LBP from Surveillance Report 1 and 1 RCT[11] in FM from Surveillance Report 3).*** One RCT in older patients with knee OA pain reported six SAEs; five were in the exercise group [4 falls (1 resulting in distal radius fracture); 1 foot fracture from dropping a dumbbell]. Sudden death was reported in one attention control participant. ***Another RCT from Surveillance Report 1 in patients with knee OA reported one SAE: a patient in the aqua cycling group with a history of cardiovascular disease hyperventilated and was hospitalized overnight; the patient continued with training after 2 weeks of rest.[24]*** No other intervention-related SAEs requiring medical intervention were reported across trials of exercise for LBP, neck pain, OA pain, or FM. Reported AEs included minor and/or temporary increases in pain with exercise ranging from 3% to 22% versus 0% to 3% for comparators; ***accident/injury, fall, headache, bruising, and dizziness were rare (≤2%) with exercise in one trial of knee OA identified for Surveillance Report 1.[25]*** Withdrawal for worsening pain ranged between 3% and 10% compared with 0% in usual care or no treatment groups.
Psychological therapies vs. usual care, waitlist, no treatment, attention control, exercise	***No intervention-related SAEs requiring medical intervention were reported for psychological therapies vs. usual care, waitlist, or attention control for LBP (including 1 RCT from Surveillance Report 1),[15]*** knee OA pain, or CTH. Harms were not reported in neck pain trials. Withdrawal due to an AE (claim that physiotherapist hurt participant or participant did not benefit) was similar for psychological therapies versus usual care (0.2% vs. 0.4%, 1 in each group) in one LBP trial. For CTH, withdrawal and risk of intervention-related AEs (not specified) was 2% in one small trial. For FM, AEs were more commonly reported in control groups (attention control, waitlist, usual care, pregabalin with duloxetine and exercise). Intervention-specific withdrawal due to depression (2 patients) was reported in one trial; another reported brief, occasional exacerbation of symptoms (pain, sleep problems). Most trials reported that there were no AEs.
Ultrasound vs. sham ultrasound **Interferential therapy** vs. sham	For LBP, risk of SAEs (not defined, not considered to be intervention related) was similar for ultrasound and sham [3 patients (1.3%) vs. 6 patients (2.7%), respectively], as was risk of any AE (6.0% vs. 5.9%) in one trial. No AEs were identified across trials in knee OA pain. In one trial of interferential therapy, withdrawal due to any AE (not defined) was similar (4% in each group).
Low-level laser therapy vs. sham or exercise	No AEs were reported vs. sham in knee OA patients. ***For LBP, three trials reported no AEs versus sham or exercise, and one trial from Surveillance Report 1 reported that 50 percent of patients experienced a temporary increase in pain following the first session of true LLLT; all other events in the latter trial occurred in the sham laser group (likely due to concomitant use of naproxen per the authors).[16]*** Erythema was experienced by one patient with hand OA. In patients with neck pain, in one trial, AEs in the intervention group included mild (78%) or moderate (60%) increased neck pain, increased pain elsewhere (78%), mild headache (60%), and tiredness (24%).
TENS vs. sham	***For LBP, no TENS-associated side effects occurred in any patient in one trial from Surveillance Report 1.[17]*** ***For knee OA, no evidence of increased risk of serious harms (2 RCTs, including 1 RCT[7] from Surveillance Report 3) and no differences between TENS vs. sham for minor harms across both trials (12% both groups) and for discontinuation due to minor events (1% vs. 2%) in the one new trial from Surveillance Report 3.[7]***

Intervention	Reported Adverse Events
Diathermy vs. sham **Electromagnetic field** vs. sham	For knee OA, two cases of transient symptom aggravation with microwave diathermy were reported (1 RCT), and 24 patients reported throbbing sensation or warming sensations or aggravation of pain with electromagnetic field treatment (1 RCT).
Spinal manipulation vs. usual care, attention control, placebo, exercise, or pharmacological treatment	For LBP, no SAEs or withdrawal due to AEs (not defined) were observed (10 RCTs); primary nonserious AEs reported included mild to moderate increase in pain, local discomfort and tiredness (2 RCTs). For FM, no SAEs (1 RCT) and no AEs (1 RCT) were observed. For CTH, temporary neck stiffness occurred; 1.4% of patients withdrew from the manipulation group vs. 8.9% from the amitriptyline group in one trial. ***For FM, no adverse events occurred in two RCTs, included SAEs in one new trial from Surveillance Report 1.***[35]
Massage vs. sham, usual care, attention control, exercise	***No serious intervention-related adverse events requiring medical intervention were reported with massage for LBP (including 1 RCT from Surveillance Report 1),***[18] neck pain, OA pain, or FM. ***Nonserious AEs included discomfort, aching muscles, headache, and tenderness; reports of increased pain ranged from <1% to 26% for LBP.***
MBSR vs. usual care	For LBP in one trial, 29% of MBSR patients reported temporarily increased pain. ***For FM, in one new trial identified for Surveillance Report 1,***[36] ***16% of MBSR patients reported AEs that occurred with varying frequency and included mild fatigue, intense palpitations, fatigue, tension, headaches, dizziness, somnolence, gain of weight, and loss of sexual desire.***
Mind-body practices (yoga, Tai Chi, Qigong) vs. usual care, attention control, waitlist, exercise	For LBP, three SAEs were reported in one yoga patient each: cellulitis and a herniated disc in one RCT (0.8% for both, unclear if these were treatment related) and severe back pain possibly or probably related to yoga in another RCT (1%). No trial of neck pain, knee OA pain, or FM reported SAEs due to mind-body practices in their populations. ***Nonserious AEs reported across studies: for LBP, range 7% to 16% across five RCTs (1 new trial from Surveillance Report 1)***[20] ***of yoga or Qigong, mostly related to increased back/joint pain, muscle soreness, or dizziness;*** for neck pain, knee injury and muscle spasms (0.6%; 1 case each) in one RCT of Alexander Technique and an event risk of 0.27 in one RCT of body awareness therapy (primarily due to increased pain); for knee OA pain, mild muscle soreness and foot or knee pain were reported with Tai Chi in one RCT (no data provided); and for FM, mild to moderate treatment-related AEs occurred in 4% (Tai Chi) and 5% (Qigong) of patients in 2 RCTs; shoulder pain, plantar fasciitis were specified; others were not.
Acupuncture vs. sham, usual care, attention control, placebo, pharmacological therapy	Treatment-related SAEs were rare (across 5 LBP, 5 neck pain, 4 FM, 1 knee OA, and 1 CTH trial); only one event (needle insertion site pain lasting 1 month) in an LBP patient (<1%) in one trial was considered related to treatment, SAEs not considered to be related to acupuncture or the study conditions (range 0% to 9% across 5 LBP, 5 neck pain, 4 FM, 1 knee OA, and 1 CTH trial); included hospitalization (primarily) or outpatient treatment, and reasons were not specified. ***The most commonly reported nonserious AEs: swelling, bruising, bleeding or pain at the acupuncture site (1% to 61%, 14 RCTs [including 2 new RCTs, 1 LBP***[22] ***and 1 knee OA,***[32] ***from Surveillance Report 1]; or 1% to 18% excluding an outlier trial); numbness, discomfort, pain, or increase in symptoms (1% to 14%; 12 RCTs [including 1 RCT in knee OA from Surveillance Report 1]***[32]***),*** dizziness, nausea, fainting (1% to 7%, 7 RCTs), headache (1% to 2%; 4 RCTs), vasovagal symptoms (1% to 4%; 2 RCTs), respiratory problems, chest discomfort (1%; 2 RCTs [neck pain]), ***anxiety (2%; 1 new RCT [LBP]***[22] ***from Surveillance Report 1),*** and infection at needle insertion site (1%; 1 RCT [knee OA]).
MDR vs. usual care, waitlist, exercise, pharmacological therapy	No intervention-related SAEs requiring medical intervention were reported. Specified nonserious AEs included transient worsening of pain (3 patients), including one report of a painful swollen hand after a treatment session, and mood alteration (2 patients). One trial reported that 19% of MDR recipients with FM withdrew, with two patients attributing withdrawal to increased pain.

Abbreviations: AE = adverse event; CTH = chronic tension headache; FM = fibromyalgia; LBP = low back pain; LLLT = low-level laser therapy; MBSR = mindfulness-based stress reduction; MDR = multidisciplinary rehabilitation; OA = osteoarthritis; RCT = randomized controlled trial; SAE = serious adverse event; TENS = transcutaneous electrical nerve stimulation.

Evidence Details

Key Question 1: Chronic Low Back Pain

Exercise for Chronic Low Back Pain

Exercise Compared With Usual Care, an Attention Control, or a Placebo Intervention

One new small fair-quality trial (N=39) of exercise (Pilates [16 60-minute sessions twice per week for 8 weeks]) versus usual care in patients with chronic LBP was identified for Surveillance Report 3.[10] There were no differences between groups in the short term (4.5 months) for *function* (difference –1.10 on the 0 to 24 scale RDQ, 95% confidence interval [CI] –4.80 to 2.60) and *pain* (difference 0.65 on a 0 to 10 scale, 95% CI –0.86 to 2.16). Harms were not reported.

In meta-analyses updated with the one new trial identified for Surveillance Report 3 and the two trials identified for Surveillance Report 1, estimates were the same as the 2020 report for *function* (13 RCTs, n=1,126; updated pooled SMD –0.33, 95% CI –0.51 to –0.16, I^2=38.6% excluding the same outlier trial as the 2020 report) and slightly attenuated for *pain* (13 RCTs, n=1,131; pooled difference –1.05 on a 0 to 10 scale, 95% CI –1.58 to –0.51, I^2=65.8%) at short-term followup. In a meta-analysis updated with the one new trial identified for Surveillance Report 3 that evaluated function using only the RDQ, the estimate was similar to the 2020 report (8 RCTs, n=727; pooled difference −2.78 on a 0 to 24 scale, 95% CI −3.28 to −1.38, I^2=31.9%). Consistent with the 2020 report, there were no clear differences in estimates for either function or pain short term when analyses were stratified according to the type of exercise or the type of control, or when poor-quality trials were excluded. These findings did not change our previous conclusions of a small improvement in *function* (SOE moderate) and a moderate improvement in *pain* (SOE low) with exercise versus usual care, attention control, or a placebo intervention at short term.

Psychological Therapies for Chronic Low Back Pain

Psychological Therapies Compared With Usual Care or an Attention Control

One new small fair-quality trial (N=30)[8] of rumination-focused cognitive behavioral therapy (CBT) (12 60-minute sessions once per week for 12 weeks) versus usual care in patients with chronic LBP was identified for Surveillance Report 3 and provided data for short-term pain only. CBT was associated with a small improvement in *pain* compared with usual care (difference –0.49 on a 0 to 10 scale, 95% CI –0.71 to –0.27). Harms were not reported.

In an updated meta-analysis including this one new trial from Surveillance Report 3 and one trial identified for Surveillance Report 1, the estimate for short-term pain was the same as the 2020 report (5 RCTs, n=1,048; pooled difference –0.76 on a 0-10 scale, 95% CI –1.22 to –0.36, I^2=57%) but with increased heterogeneity due to the addition of the trial from Surveillance Report 1, which was an outlier in favor of psychological therapy (difference –1.70 vs. –0.14 to –0.82 across the other 4 RCTs). This may in part be due to the type of intervention used in this trial, a proprietary pain reprocessing therapy (PRT). The bulk of the evidence for psychological therapies in the original report was from large trials focused on CBT. While PRT incorporates aspects of CBT, it also includes other psychological interventions used in pain management and

emphasizes exposure-based interventions in conjunction with reappraising pain. These findings did not change our previous conclusions of a small improvement in *pain* (SOE moderate) with psychological therapy versus usual care or an attention control at short term.

Key Question 3: Osteoarthritis Knee Pain

Physical Modalities for Osteoarthritis Knee Pain

Transcutaneous Electrical Stimulation Compared With Sham

One new good-quality trial (n=220)[7] comparing TENS versus sham TENS in patients with knee OA was identified for Surveillance Report 3 and reported short-term outcomes only. There were no trials in the 2020 report that reported short-term outcomes for this comparison. Patients in both groups received a total of nine sessions (up to 60 minutes duration) over 3 weeks (conducted 4 times per week in the first week, 3 times in the second week, and 2 times in the third week). TENS setting and intensity were individualized to the patient according to symptom presentation using typically recommended parameters (low-frequency, high-frequency, or burst TENS). In the sham group, current was delivered for 45 seconds, after which it automatically ramped down until it was off.

There were no differences between groups in *function* based on the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) physical function scale (difference 0.08 on a 0 to 63 scale, 95% CI –0.28 to 0.43) or *pain* on the WOMAC pain scale (difference 0.01 on the 0 to 20 scale, 95% CI –0.37 to 0.39) or the VAS pain scale (difference 0.09, 95% CI –0.41 to 0.59) at short term. Similarly, there was no difference in the proportion of patients who achieved 50 percent or more and 30 percent or more improvement in pain on the WOMAC scale following TENS versus sham TENS, respectively: 38 percent versus 41 percent, risk ratio (RR) 0.9 (95% CI 0.7 to 1.3) and 62 percent versus 50 percent, RR 1.2 (95% CI 0.9 to 1.6). The SOE was low for both function and pain short term.

No patient experienced severe adverse events. Similar proportions of patients in both the TENS and the sham TENS groups reported minor adverse events (10.4% vs. 10.6%) and discontinued therapy due to minor adverse events (0.9% vs. 1.8%).

Mind-Body Therapies for Osteoarthritis Knee Pain

Yoga Compared With Attention Control

One new poor-quality trial (n=112)[6] compared chair yoga (16 45-minute sessions conducted twice weekly) versus an attention control (health education lectures and discussion) over a treatment period of 8 weeks in older adults (mean age 75 years) with knee OA. The authors provided estimates for short-term pain (pain interference) for men and women separately and found that chair yoga was effective in both sexes but more effective in women (effect sizes not calculable). The evidence was considered insufficient to draw conclusions.

Qigong Compared With Usual Care

There were no trials of Qigong compared with usual care in the 2020 report. (All included trials were of Tai Chi vs. attention control.) One new poor-quality trial (n=266)[9] was identified for Surveillance Report 3 that compared 24 weeks of Qigong (144 sessions total, 60 minutes duration, 6 times per week) versus usual care. Qigong was associated with improvements in *function* according to the WOMAC physical function score (difference –39.9, 95% CI –62.7 to –

17.0) and *pain* based on the WOMAC pain score (difference –18.7, 95% CI –24.5 to –12.8) at intermediate term (immediately post 6-month treatment). The scales used for the WOMAC were not reported and did not appear to be typical WOMAC scales.

In an updated meta-analysis including this one new trial from Surveillance Report 3 and one trial identified for Surveillance Report 1, the estimate for intermediate-term *function* showed a large effect favoring mind-body therapies versus controls (pooled SMD –0.92, 95% CI –1.74 to –0.15, I^2=80.2%) but heterogeneity was substantial. Excluding the poor-quality outlier trial substantially reduced the heterogeneity and resulted in a small improvement in *function* (pooled SMD –0.48, 95% CI –1.03 to –0.18, I^2=37.8%). For pain, an updated meta-analysis including the same trials as for function also resulted in a large effect favoring mind-body therapies (pooled SMD –0.83, 95% CI –1.16 to –0.57, I^2=0%); exclusion of the poor-quality trial resulted in a reduced effect, a moderate improvement in *pain* (pooled SMD –0.75, 95% CI –1.05 to –0.42, I^2=0%). The addition of the two new trials (1 from Surveillance Report 1 and 1 from Surveillance Report 3) changed the 2020 report's conclusion from insufficient evidence to low SOE for a small improvement in *function* and a moderate improvement in *pain* at intermediate term for mind-body therapies (Tai Chi, Qigong) compared with usual care or attention control. Harms were not reported.

Key Question 4: Fibromyalgia

Exercise for Fibromyalgia

Exercise Compared With Usual Care, an Attention Control, or No Treatment

One followup publication to a poor-quality trial evaluating core stability-based physiotherapy (10 sessions over 5 weeks) versus usual care (N=69)[11] that was included in Surveillance Report 1 was identified for Surveillance Report 3. This trial also included an acupuncture arm, the results for which are reported below. This new publication provided data for the FIQ total score (the prior publication provided data for the FIQ physical function subscale only) and for VAS pain (the prior publication did not report pain outcomes) at short term followup, which allowed us to pool these data with trials included in the 2020 report.

In an updated meta-analysis including this one new publication from Surveillance Report 3 and one trial identified for Surveillance Report 1, the estimate was slightly larger than the 2020 report estimate for short-term *function* (9 RCTs, n=545; pooled difference −8.39 on the 0 to 100 FIQ scale, 95% CI −12.87 to −3.61, I^2=56.8%). For short-term *pain*, the estimate from an updated meta-analysis including this one new publication from Surveillance Report 3 was similar to the 2020 report (7 RCTs, n=406; pooled difference –0.84, 95% CI –1.24 to –0.30, I^2=0.8% excluding the same outlier trial as the 2020 report). The addition of this new publication does not change the 2020 report's conclusions of a small improvement in *function* (SOE low) and a small improvement in *pain* (SOE moderate) with exercise versus usual care, an attention control, or no treatment at short term.

Acupuncture for Fibromyalgia

Acupuncture Compared With Usual Care or Sham and With Exercise

As mentioned above, one followup publication to a poor-quality trial evaluating 10 sessions (over 5 weeks) of traditional Chinese medicine needle acupuncture versus usual care (n=67) and versus core stability exercise (N=70) that was included in Surveillance Report 1[11] was identified

for Surveillance Report 3. This new publication provided short-term data for function (the FIQ total score) and pain (VAS pain) not reported previously, which allowed us to pool these data with trials included in the 2020 report for the comparison with usual care or sham. (There were 3 trials vs. sham acupuncture.) In updated meta-analyses including this one new publication from Surveillance Report 3, the estimates were slightly attenuated compared with the 2020 report for *function* (4 RCTs, n=350; pooled difference –8.60 on the 0-100 FIQ, 95% CI –12.00 to –5.42, I^2=0%) and pain (6 RCTs, n=466; pooled difference −1.04 on a 0 to 10 scale, 95% CI −2.27 to 0.16, I^2=89.5%) at short term. The addition of this new publication does not change the 2020 report's conclusions of a small improvement in *function* (SOE moderate) and no difference in *pain* (SOE low) with acupuncture versus usual care or sham at short term. No harms were reported in either group.

There were no trials of acupuncture compared with exercise in the prior report. There was no difference between groups in short-term *function* based on the FIQ total score (difference 0.12 on a 0-100 scale, 95% CI –8.20 to 8.44) and short-term *pain* based on the VAS (difference –0.02 on a 0 to 10 scale, 95% CI –1.06 to 110). The evidence was considered insufficient to draw conclusions. No harms were reported in the acupuncture group; one woman in the exercise group experienced increased knee pain and had to rest for the last three sessions.

Conclusions

New evidence from two trials in patients with chronic LBP and one subsequent publication to a previously included trial for FM identified for Surveillance Report 3 was consistent with the 2020 review and did not alter its conclusions. For **LBP**, updated meta-analyses provided very similar estimates and included one trial of exercise (Pilates) versus usual care (small improvement in function [SOE moderate] and moderate improvement in pain [SOE low] short term) and one trial of psychological therapy (CBT) versus usual care (small improvement in short-term pain [SOE low]). For **FM**, the newly identified publication comparing exercise, standard acupuncture, and usual care provided outcomes for function and pain not reported previously, allowing us to pool these data with trials included in the 2020 report. Updated meta-analyses including this trial provided estimates similar to the original report for comparisons of exercise versus usual care, sham, or attention control (small improvement in function [SOE low] and pain [SOE moderate] short term) and acupuncture versus usual care or sham (small improvement in function [SOE moderate] and no difference in pain [SOE low] short term); there was no evidence in the prior report for the comparison of acupuncture with exercise and the evidence was considered insufficient for this new comparison.

For **knee OA**, evidence from three new trials identified for Surveillance Report 3 resulted in changes to the prior reports' conclusion or the addition of new interventions or timepoints for which there was no evidence previously. Updated meta-analyses including one new trial that compared Qigong with usual care resulted in upgrading SOE from insufficient to low for small improvements in function and moderate improvements in pain at intermediate term for the mind-body therapies versus attention control or usual care. There was low strength of evidence from one new trial comparing TENS versus sham TENS of no effect for function or pain short term (new timepoint) and insufficient evidence from another trial of chair yoga (new intervention) versus attention control for elderly patients with knee OA.

Harms were poorly reported across interventions. No serious intervention-related adverse events (e.g., leading to death or disability or requiring intensive medical attention) were identified; reported adverse events were generally minor and time limited. Consistent with the

original report, no trials in pregnant or breastfeeding women with pre-existing chronic pain or trials comparing interventions with opioids, topical agents, medical cannabis, or muscle relaxants were identified for this update, and no new data were available to evaluate nociplasticity as a modifier to treatment effectiveness or safety.

References

1. Skelly AC, Chou R, Dettori JR, et al. Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review Update. Comparative Effectiveness Review No. 227. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 290-2015-00009-I.) AHRQ Publication No. 20-EHC009. Rockville, MD: Agency for Healthcare Research and Quality; April 2020. https://effectivehealthcare.ahrq.gov/products/noninvasive-nonpharm-pain-update/research. PMID: 32338846.
2. Chou R, Dana T, Shetty KD. Testing a Machine Learning Tool for Facilitating Living Systematic Reviews of Chronic Pain Treatments. Methods Research Report. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 290-2015-00009-I and the Southern California Evidence-based Practice Center-RAND Corporation under Contract No. 290-2015-00010-I.) AHRQ Publication No. 21-EHC004. Rockville, MD: Agency for Healthcare Research and Quality; November 2020. Posted final reports are located on the Effective Health Care Program search page. DOI: 10.23970/AHRQEPCMETHTESTINGMACHINELEARNING.
3. Higgins JPT, Green S, eds. Cochrane Handbook for Systematic Reviews of Interventions. Version 5.1.0 [updated March 2011]. The Cochrane Collaboration. Available from http://handbook.cochrane.org.; 2011.
4. Methods Guide for Effectiveness and Comparative Effectiveness Reviews. AHRQ Publication No. 10(14)-EHC063-EF. Rockville, MD: Agency for Healthcare Research and Quality. January 2014. Chapters available at: www.effectivehealthcare.ahrq.gov.
5. Furlan AD, Malmivaara A, Chou R, et al. 2015 Updated Method Guideline for Systematic Reviews in the Cochrane Back and Neck Group. Spine (Phila Pa 1976). 2015 Nov;40(21):1660-73. doi: 10.1097/BRS.0000000000001061. PMID: 26208232.
6. Park J, Herron C. Effects of a Movement-Based Mind-Body Intervention in Managing Symptoms in Older Adults with Osteoarthritis: gender, Age, and Living Arrangement Differences. Alternative & complementary therapies. 2021;27(3):111-23.
7. Reichenbach S, Juni P, Hincapie CA, et al. Effect of transcutaneous electrical nerve stimulation (TENS) on knee pain and physical function in patients with symptomatic knee osteoarthritis: the ETRELKA randomized clinical trial. Osteoarthritis and cartilage. 2021 PMID: 34826572.
8. Soleymani A, Arani AM, Raeissadat SA, et al. Rumination-focused cognitive-behavioral therapy for chronic low back pain: a randomized controlled trial. Galen medical journal. 2021;9 PMID: 34466577.
9. Xiao Z, Li G. The effect of Wuqinxi exercises on the balance function and subjective quality of life in elderly, female knee osteoarthritis patients. American journal of translational research. 2021;13(6):6710-6. PMID: 34306416.
10. Yang CY, Tsai YA, Wu PK, et al. Pilates-based core exercise improves health-related quality of life in people living with chronic low back pain: a pilot study. Journal of bodywork and movement therapies. 2021;27:294-9. PMID: 34391248.
11. Garrido-Ardila EM, Gonzalez-Lopez-arza MV, Jimenez-Palomares M, et al. Effects of physiotherapy vs. Acupuncture in quality of life, pain, stiffness, difficulty to work and depression of women with fibromyalgia: a randomized controlled trial. Journal of clinical medicine. 2021;10(17) PMID: 34501213.
12. Marshall A, Joyce CT, Tseng B, et al. Changes in Pain Self-Efficacy, Coping Skills and Fear Avoidance Beliefs in a Randomized Controlled Trial of Yoga, Physical Therapy, and Education for Chronic Low Back Pain. Pain medicine. 2021 PMID: 34698869.
13. Lang AE, Hendrick PA, Clay L, et al. A randomized controlled trial investigating

effects of an individualized pedometer driven walking program on chronic low back pain. BMC Musculoskeletal Disorders. 2021 Feb 19;22(1):206. doi: https://dx.doi.org/10.1186/s12891-021-04060-8. PMID: 33607979.

14. Shariat A, Alizadeh R, Moradi V, et al. The impact of modified exercise and relaxation therapy on chronic lower back pain in office workers: a randomized clinical trial. Journal of Exercise Rehabilitation. 2019 Oct;15(5):703-8. doi: https://dx.doi.org/10.12965/jer.1938490.245. PMID: 31723560.

15. Ashar YK, Gordon A, Schubiner H, et al. Effect of Pain Reprocessing Therapy vs Placebo and Usual Care for Patients With Chronic Back Pain: A Randomized Clinical Trial. JAMA Psychiatry. 2021 Sep 29doi: 10.1001/jamapsychiatry.2021.2669. PMID: 34586357.

16. Kholoosy L, Elyaspour D, Akhgari MR, et al. Evaluation of the Therapeutic Effect of Low Level Laser in Controlling Low Back Pain: A Randomized Controlled Trial. Journal of Lasers in Medical Sciences. 2020;11(2):120-5. doi: https://dx.doi.org/10.34172/jlms.2020.21. PMID: 32273951.

17. Yaksi E, Ketenci A, Baslo MB, et al. Does transcutaneous electrical nerve stimulation affect pain, neuropathic pain, and sympathetic skin responses in the treatment of chronic low back pain? A randomized, placebo-controlled study. The Korean journal of pain. 2021 Apr 01;34(2):217-28. doi: https://dx.doi.org/10.3344/kjp.2021.34.2.217. PMID: 33785674.

18. Kobayashi D, Shimbo T, Hayashi H, et al. Shiatsu for chronic lower back pain: Randomized controlled study. Complementary Therapies in Medicine. 2019 Aug;45:33-7. doi: https://dx.doi.org/10.1016/j.ctim.2019.05.019. PMID: 31331579.

19. Thomas JS, Clark BC, Russ DW, et al. Effect of Spinal Manipulative and Mobilization Therapies in Young Adults With Mild to Moderate Chronic Low Back Pain: A Randomized Clinical Trial. JAMA Network Open. 2020 08 03;3(8):e2012589. doi: https://dx.doi.org/10.1001/jamanetworkopen.2020.12589. PMID: 32756930.

20. Michalsen A, Jeitler M, Kessler CS, et al. Yoga, Eurythmy Therapy and Standard Physiotherapy (YES-Trial) for Patients With Chronic Non-specific Low Back Pain: A Three-Armed Randomized Controlled Trial. Journal of Pain. 2021 Apr 20;20:20. doi: https://dx.doi.org/10.1016/j.jpain.2021.03.154. PMID: 33892154.

21. Neyaz O, Sumila L, Nanda S, et al. Effectiveness of Hatha Yoga Versus Conventional Therapeutic Exercises for Chronic Nonspecific Low-Back Pain. Journal of Alternative & Complementary Medicine. 2019 Sep;25(9):938-45. doi: https://dx.doi.org/10.1089/acm.2019.0140. PMID: 31347920.

22. Luo Y, Yang M, Liu T, et al. Effect of hand-ear acupuncture on chronic low-back pain: a randomized controlled trial. Journal of traditional chinese medicine = chung i tsa chih ying wen pan. 2019;39(4):587-98. PMID: CN-02144857.

23. Bernal-Utrera C, Gonzalez-Gerez JJ, Anarte-Lazo E, et al. Manual therapy versus therapeutic exercise in non-specific chronic neck pain: a randomized controlled trial. Trials [Electronic Resource]. 2020 Jul 28;21(1):682. doi: https://dx.doi.org/10.1186/s13063-020-04610-w. PMID: 32723399.

24. Rewald S, Lenssen AFT, Emans PJ, et al. Aquatic Cycling Improves Knee Pain and Physical Functioning in Patients With Knee Osteoarthritis: A Randomized Controlled Trial. Archives of Physical Medicine & Rehabilitation. 2020 08;101(8):1288-95. doi: https://dx.doi.org/10.1016/j.apmr.2019.12.023. PMID: 32169459.

25. Messier SP, Mihalko SL, Beavers DP, et al. Effect of High-Intensity Strength Training on Knee Pain and Knee Joint Compressive Forces Among Adults With Knee Osteoarthritis: The START Randomized Clinical Trial. JAMA. 2021 02 16;325(7):646-57. doi: https://dx.doi.org/10.1001/jama.2021.0411. PMID: 33591346.

26. Munukka M, Waller B, Hakkinen A, et al. Effects of progressive aquatic resistance

training on symptoms and quality of life in women with knee osteoarthritis: A secondary analysis. Scandinavian Journal of Medicine & Science in Sports. 2020 Jun;30(6):1064-72. doi: https://dx.doi.org/10.1111/sms.13630. PMID: 31999876.

27. Alqualo-Costa R, Rampazo EP, Thome GR, et al. Interferential current and photobiomodulation in knee osteoarthritis: A randomized, placebo-controlled, double-blind clinical trial. Clinical Rehabilitation. 2021 Apr 26:2692155211012004. doi: https://dx.doi.org/10.1177/02692155211012004. PMID: 33896234.

28. Karakas A, Dilek B, Sahin MA, et al. The effectiveness of pulsed ultrasound treatment on pain, function, synovial sac thickness and femoral cartilage thickness in patients with knee osteoarthritis: a randomized, double-blind clinical, controlled study. Clinical Rehabilitation. 2020 Dec;34(12):1474-84. doi: https://dx.doi.org/10.1177/02692155209429 53. PMID: 32715744.

29. Pehlivan S, Karadakovan A. Effects of aromatherapy massage on pain, functional state, and quality of life in an elderly individual with knee osteoarthritis. Japan journal of nursing science. 2019;16(4):450-8. PMID: CN-02078086 NEW.

30. Hu X, Lai Z, Wang L. Effects of Taichi exercise on knee and ankle proprioception among individuals with knee osteoarthritis. Research in Sports Medicine. 2020 Apr-Jun;28(2):268-78. doi: https://dx.doi.org/10.1080/15438627.2019.1663520. PMID: 31524502.

31. Xiao CM, Li JJ, Kang Y, et al. Follow-up of a Wuqinxi exercise at home programme to reduce pain and improve function for knee osteoarthritis in older people: a randomised controlled trial. Age & Ageing. 2021 02 26;50(2):570-5. doi: https://dx.doi.org/10.1093/ageing/afaa179. PMID: 32931545.

32. Lam WC, Au KY, Qin Z, et al. Superficial needling acupuncture versus sham acupuncture for knee osteoarthritis: a randomized controlled trial. American Journal of Medicine. 2021 Jun 11;11:11. doi: https://dx.doi.org/10.1016/j.amjmed.2021.05.002. PMID: 34126097.

33. Garrido-Ardila EM, Gonzalez-Lopez-Arza MV, Jimenez-Palomares M, et al. Effectiveness of acupuncture vs. core stability training in balance and functional capacity of women with fibromyalgia: a randomized controlled trial. Clinical Rehabilitation. 2020 May;34(5):630-45. doi: https://dx.doi.org/10.1177/02692155209119 92. PMID: 32204612.

34. Patru S, Padureanu R, Dumitrescu F, et al. Influence of multidisciplinary therapeutic approach on fibromyalgia patients. Experimental & Therapeutic Medicine. 2021 May;21(5):528. doi: https://dx.doi.org/10.3892/etm.2021.9960. PMID: 33815601.

35. Coste J, Medkour T, Maigne JY, et al. Osteopathic medicine for fibromyalgia: a sham-controlled randomized clinical trial. Therapeutic Advances in Musculoskeletal Disease. 2021;13:1759720X211009017. doi: https://dx.doi.org/10.1177/1759720X211009017. PMID: 33948127.

36. Perez-Aranda A, Feliu-Soler A, Montero-Marin J, et al. A randomized controlled efficacy trial of mindfulness-based stress reduction compared with an active control group and usual care for fibromyalgia: the EUDAIMON study. Pain. 2019 11;160(11):2508-23. doi: https://dx.doi.org/10.1097/j.pain.0000000000001655. PMID: 31356450.

37. Bravo C, Skjaerven LH, Espart A, et al. Basic Body Awareness Therapy in patients suffering from fibromyalgia: a randomized clinical trial. Physiotherapy theory and practice. 2019;35(10):919-29. PMID: CN-01980930.

Authors

Andrea C. Skelly, Ph.D., M.P.H
Erika D. Brodt, B.S.
Shelby Kantner, B.A.
Andrea Diulio-Nakamura, Ph.D.
Kim Mauer, M.D.
Kanaka D. Shetty, M.D., M.S.

Acknowledgments

The authors gratefully acknowledge the following individuals for their contributions to this project: research associate and librarian Tracy Dana, M.L.S., and research associate Christina Bougatsos, M.P.H., both from Oregon Health & Science University; Task Order Officer Suchitra Iyer, Ph.D., at the Agency for Healthcare Research and Quality.

Disclaimers

This report is based on research conducted by the Pacific Northwest Evidence-based Practice Center under contract to the Agency for Healthcare Research and Quality (AHRQ), Rockville, MD (Contract No. 75Q80120D00006). The findings and conclusions in this document are those of the authors, who are responsible for its contents; the findings and conclusions do not necessarily represent the views of AHRQ. Therefore, no statement in this report should be construed as an official position of AHRQ or of the U.S. Department of Health and Human Services.

None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

The information in this report is intended to help healthcare decision makers—patients and clinicians, health system leaders, and policymakers, among others—make well-informed decisions and thereby improve the quality of health care services. This report is not intended to be a substitute for the application of clinical judgment. Anyone who makes decisions concerning the provision of clinical care should consider this report in the same way as any medical reference and in conjunction with all other pertinent information, i.e., in the context of available resources and circumstances presented by individual patients.

Suggested citation: Skelly AC, Brodt ED, Kantner S, Diulio-Nakamura A, Mauer K, Shetty KD. Systematic Review on Noninvasive Nonpharmacological Treatments for Chronic Pain: Surveillance Report 3. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 75Q80120D00006.) AHRQ Publication No. 22-EHC035. Rockville, MD: Agency for Healthcare Research and Quality; June 2022. DOI:

https://doi.org/10.23970/AHRQEPCNONINVASIVENONPHARMASURVEILLANCE3. Posted final reports are located on the Effective Health Care Program search page.

Afterword

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of systematic reviews to assist public- and private-sector organizations in their efforts to improve the quality of healthcare in the United States. These reviews provide comprehensive, science-based information on common, costly medical conditions, and new healthcare technologies and strategies.

Systematic reviews are the building blocks underlying evidence-based practice; they focus attention on the strength and limits of evidence from research studies about the effectiveness and safety of a clinical intervention. In the context of developing recommendations for practice, systematic reviews can help clarify whether assertions about the value of the intervention are based on strong evidence from clinical studies. For more information about AHRQ EPC systematic reviews, see https://effectivehealthcare.ahrq.gov/about/epc/evidence-synthesis.

This quarterly surveillance report provides up-to-date information about the evidence base to inform health plans, providers, purchasers, government programs, and the healthcare system as a whole on the state of the science. Transparency and stakeholder input are essential to the Effective Health Care Program. Please visit the website (www.effectivehealthcare.ahrq.gov) to see draft research questions and reports or to join an email list to learn about new program products and opportunities for input.

If you have comments on this report, they may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 5600 Fishers Lane, Rockville, MD 20857, or by email to epc@ahrq.hhs.gov.

Robert Otto Valdez, Ph.D., M.H.S.A.
Director
Agency for Healthcare Research and Quality

Arlene S. Bierman, M.D., M.S.
Director
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality

Craig A. Umscheid, M.D., M.S.
Director
Evidence-based Practice Center Program
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality

Suchitra Iyer, Ph.D.
Task Order Officer
Evidence-based Practice Center Program
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality

Appendix Contents

Appendix A. Literature Search Strategies

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions(R), December 2021 through March 2022

1 exp Low Back Pain/ or ((back or spine or spinal) adj2 pain).ti,ab.
2 exp Chronic Pain/
3 Neck Pain/ or neck.ti,ab.
4 exp Osteoarthritis/ or osteoarthritis.ti,ab.
5 Headache/ or headache.ti,ab.
6 Fibromyalgia/ or fibromyalgia.ti,ab.
7 exp Exercise Therapy/
8 exp Physical Therapy Modalities/
9 exp Braces/
10 exp Mind-Body Therapies/
11 exp Acupuncture Therapy/
12 exp Rehabilitation/
13 exp Psychotherapy/
14 exp Musculoskeletal Manipulations/
15 (noninvasive or non-invasive or nonpharmacologic* or non-pharmacologic*).ti,ab.
16 (exercise or physical therapy or cognitive or behavioral or feedback or relaxation or acceptance or commitment or traction or ultrasound or stimulation or laser or magnet* or inferential or electromuscular or diathermy or heat or cold or manipulation or manual or craniosacral or mindfulness or meditation or mind-body or yoga or pilates or Qigong or acupuncture or functional restoration or multidisciplin* or interdisciplin*).ti,ab.
17 rh.fs.
18 or/1-6
19 or/7-17
20 18 and 19
21 randomized controlled trial.pt.
22 controlled clinical trial.pt.
23 clinical trials as topic.sh.
24 (random* or trial or placebo).ti,ab.
25 clinical trials as topic.sh.
26 exp animals/ not humans.sh.
27 or/21-25
28 27 not 26
29 20 and 28
30 limit 29 to english language
31 limit 30 to humans
32 31 and (20171$ or 2018$).dt,ed,ep.
33 meta-analysis.pt.
34 meta-analysis/ or systematic review/ or meta-analysis as topic/ or "meta analysis (topic)"/ or "systematic review (topic)"/ or exp technology assessment, biomedical/
35 ((systematic* adj3 (review* or overview*)) or (methodologic* adj3 (review* or overview*))).ti,ab.
36 ((quantitative adj3 (review* or overview* or synthes*)) or (research adj3 (integrati* or overview*))).ti,ab.

37 ((integrative adj3 (review* or overview*)) or (collaborative adj3 (review* or overview*)) or (pool* adj3 analy*)).ti,ab.
38 (data synthes* or data extraction* or data abstraction*).ti,ab.
39 (handsearch* or hand search*).ti,ab.
40 (mantel haenszel or peto or der simonian or dersimonian or fixed effect* or latin square*).ti,ab.
41 (met analy* or metanaly* or technology assessment* or HTA or HTAs or technology overview* or technology appraisal*).ti,ab.
42 (meta regression* or metaregression*).ti,ab.
43 (meta-analy* or metaanaly* or systematic review* or biomedical technology assessment* or bio-medical technology assessment*).mp,hw.
44 (medline or cochrane or pubmed or medlars or embase or cinahl).ti,ab,hw.
45 (cochrane or (health adj2 technology assessment) or evidence report).jw.
46 (meta-analysis or systematic review).ti,ab.
47 (comparative adj3 (efficacy or effectiveness)).ti,ab.
48 (outcomes research or relative effectiveness).ti,ab.
49 ((indirect or indirect treatment or mixed-treatment) adj comparison*).ti,ab.
50 or/33-49
51 20 and 50
52 limit 51 to english language
53 limit 52 to humans
54 53 and (20171$ or 2018$).dt,ed,ep.
55 32 or 54

Database: EBM Reviews - Cochrane Central Register of Controlled Trials, December 2021 through March 2022
1 exp Low Back Pain/ or ((back or spine or spinal) adj2 pain).ti,ab.
2 exp Chronic Pain/
3 Neck Pain/ or neck.ti,ab.
4 exp Osteoarthritis/ or osteoarthritis.ti,ab.
5 Headache/ or headache.ti,ab.
6 Fibromyalgia/ or fibromyalgia.ti,ab.
7 exp Exercise Therapy/
8 exp Physical Therapy Modalities/
9 exp Braces/
10 exp Mind-Body Therapies/
11 exp Acupuncture Therapy/
12 exp Rehabilitation/
13 exp Psychotherapy/
14 exp Musculoskeletal Manipulations/
15 (noninvasive or non-invasive or nonpharmacologic* or non-pharmacologic*).ti,ab.
16 (exercise or physical therapy or cognitive or behavioral or feedback or relaxation or acceptance or commitment or traction or ultrasound or stimulation or laser or magnet* or inferential or electromuscular or diathermy or heat or cold or manipulation or manual or craniosacral or mindfulness or meditation or mind-body or yoga or pilates or Qigong or acupuncture or functional restoration or multidisciplin* or interdisciplin*).ti,ab.

17 rh.fs.
18 or/1-6
19 or/7-17
20 18 and 19
21 limit 20 to yr="2017 -Current"
22 limit 21 to medline records
23 21 not 22
24 limit 23 to english language

Database: EBM Reviews - Cochrane Database of Systematic Reviews, December 2021 through March 2022
1 ((back or spine or spinal) adj2 pain).ti.
2 (neck adj2 pain).ti.
3 osteoarthritis.ti.
4 headache.ti.
5 fibromyalgia.ti.
6 (noninvasive or non-invasive or nonpharmacologic* or non-pharmacologic*).ti,ab. (295)
7 (exercise or physical therapy or cognitive or behavioral or feedback or relaxation or acceptance or commitment or traction or ultrasound or stimulation or laser or magnet* or inferential or electromuscular or diathermy or heat or cold or manipulation or manual or craniosacral or mindfulness or meditation or mind-body or yoga or pilates or Qigong or acupuncture or functional restoration or multidisciplin* or interdisciplin*).ti,ab.
9 6 or 7
10 8 and 9
11 limit 10 to new reviews

Appendix B. Key Questions and Inclusion and Exclusion Criteria

Key Questions

Key Question 1: Adults with chronic low back pain

Key Question 2: Adults with chronic neck pain

Key Question 3: Adults with osteoarthritis-related pain

Key Question 4: Adults with fibromyalgia

Key Question 5: Adults with chronic tension headache

Key Questions 1–5 incorporate the following subquestions:

a. What are the benefits and harms of noninvasive nonpharmacological therapies compared with sham treatment, no treatment, waitlist, attention control, or usual care?
b. What are the benefits and harms of noninvasive nonpharmacological therapies compared with pharmacological therapy (e.g., opioids, nonsteroidal anti-inflammatory drugs, acetaminophen, antiseizure medications, antidepressants, topical agents, medical cannabis, and muscle relaxants)?
c. What are the benefits and harms of noninvasive nonpharmacological therapies compared with exercise or, for headache, biofeedback?

The three-part format for Key Questions 1–5 reflects the following research concepts:

Part "a" answers the question of whether the various interventions work overall compared with sham, waitlist control, attention control, no treatment, or usual care. For this review, usual care was defined as care that might be provided or recommended by a primary care provider.

Part "b" answers the question of whether the various interventions work compared with pharmacological alternatives.

Part "c" answers the question of how outcomes for individual interventions (e.g., acupuncture) compare with a common comparator. Exercise is the most frequent comparison in the literature for many chronic pain conditions, so it provides a common comparator for analysis. It is also recommended in most guidelines for conditions including low back pain, neck pain, fibromyalgia, and osteoarthritis and is widely available. Exercise served as common comparator for these conditions. For chronic headache, biofeedback provided a common comparator for analysis.

Key Question 6: Do estimates of benefits and harms differ by age, sex, presence of comorbidities (e.g., emotional or mood disorders), or degree of nociplasticity/central sensitization?

Inclusion and Exclusion Criteria

Table B-1. Inclusion and exclusion criteria

PICOTS	Inclusion	Exclusion
Population **All KQs**	**General Inclusion Criteria** • Adults with the following chronic pain (defined as pain lasting 12 weeks or longer or pain persisting past the time for normal tissue healing) conditions: low back pain, neck pain, osteoarthritis pain, fibromyalgia, or tension headache. • Pregnant or breastfeeding women who have a history of chronic pain prior to pregnancy	**General Exclusion Criteria** • Acute pain • Children (<18 years), pregnant or breastfeeding women with pregnancy-related back or pelvic pain or who do not have chronic pain prior to pregnancy • Patients with chronic pain related to "active" cancer, infection, inflammatory arthropathy • <90% of study sample has the defined condition of interest or <90% received the treatment(s) of interest • Treatment for addiction • Pain at the end of life • Neuropathic pain
Population **KQ1**	**KQ1: Low back pain** • Adults with chronic nonradicular low back pain	**KQ1: Low back pain** • Patients with radiculopathy • Low back pain associated with severe or progressive neurological deficits • Failed back surgery syndrome
Population **KQ2**	**KQ2: Neck pain** • Adults with chronic neck pain	**KQ2: Neck pain** • Patients with radiculopathy or myelopathy • Traumatic spinal cord injury • Neck pain associated with progressive neurological deficit, loss of strength
Population **KQ3**	**KQ3: Osteoarthritis** • Adults with osteoarthritis-related pain (primary or secondary osteoarthritis) of the hip, knee, or hand	**KQ3: Osteoarthritis** • Other types of arthritis (e.g., rheumatoid) • Patients with joint replacement
Population **KQ4**	**KQ4: Fibromyalgia** • Adults with fibromyalgia	**KQ4: Fibromyalgia** • Conditions with generalized pain not consistent with fibromyalgia • Systemic exertion intolerance disease, (myalgic encephalomyelitis/chronic fatigue syndrome) • Somatization disorder (Briquet's syndrome)

PICOTS	Inclusion	Exclusion
Population KQ5	**KQ5: Headache** • Adults with primary chronic tension headache (International Classification of Headache Disorders, 3rd edition definition). ○ Primary headaches are attributed to the headache condition itself, not headache caused by another disease or medical condition. Tension headaches are the most common. Chronic headache is defined as 15 or more days each month for at least 12 weeks or history of headache more than 180 days a year.	**KQ5: Headache** • Migraine headache • Mixed headache (also known as coexistent tension and migraine headache, chronic daily headache, transformed migraine) • Trigeminal neuralgia • Cluster headache • Secondary headache types as defined in *The International Classification of Headache Disorders*, 3rd edition (i.e., headaches due to an underlying pathology such as cancer, prior medical procedures, temporomandibular joint disorders, neck pathology, cervicogenic headache, and medication over-use headache) • Traumatic brain injury
Interventions	**All KQs:** • Exercise (exercise as part of physical therapy, supervised exercise, home exercise, group exercise, formal exercise program) • Psychological therapies (cognitive and/or behavioral therapy, biofeedback, relaxation training) • Physical modalities (traction, ultrasound, transcutaneous electrical nerve stimulation, low-level laser therapy, interferential therapy, electro-muscular stimulation diathermy, superficial heat or cold, bracing for knee, back, neck, hand and magnets) • Manual therapies (musculoskeletal manipulation, massage) • Mindfulness practices (meditation, mindfulness-based stress reduction practices) • Mind-body practices (yoga, tai chi, qigong) • Acupuncture • Multidisciplinary/interdisciplinary rehabilitation[a]	**All KQs:** • Invasive nonsurgical treatments (e.g., injections, nerve block, spinal cord stimulators, parenterally-administered medications) • Surgical interventions (including minimally invasive surgical interventions) • Diet interventions or dietary supplementation • Studies evaluating incremental value of adding a noninvasive nonpharmacological intervention to another noninvasive nonpharmacological intervention • Self-management interventions or programs, self-management education programs • Others not listed for inclusion

PICOTS	Inclusion	Exclusion
Comparators	**<u>All KQs, subquestion a</u>** • Sham treatment • Waitlist • Usual care • No treatment • Attention control intended to control for nonspecific effects (e.g., time, attention, expectations); **<u>All KQs subquestion b</u>** • Commonly used nonopioid pharmacological therapy used to treat chronic pain [NSAIDS, acetaminophen, anti-seizure medications, antidepressants (SNRIs, TCAs), muscle relaxants (including benzodiazepines)] • Topical agents (lidocaine, diclofenac, capsaicin) • Medical cannabis (inhaled, oral, topical); phytocannabinoids (plant derived, THC and CBD); FDA approved synthetic cannabinoids [Dronabionol (THC), Nabilone (similar to THC)] • Opioid analgesics **<u>KQs 1-4, 6 subquestion c</u>** • Exercise[b] **<u>KQ 5, 6 subquestion c</u>** • Biofeedback[c]	**All KQs:** • Supplements (e.g., glucosamine, chondroitin, d-ribose, herbal or homeopathic treatments) • Invasive nonsurgical treatments (e.g., injections, nerve block, spinal cord stimulators, parenterally-administered medications) • Antidepressants not typically used for chronic pain including SSRIs and MAOIs • Anti-seizure medications not typically used to treat chronic pain including topiramate, lamotrigine, levetiracetam, phenytoin, valproic acid, zonisamide, tiagabine • Surgical interventions (including minimally invasive surgical interventions) • Studies evaluating incremental value of adding a noninvasive nonpharmacological intervention to another noninvasive nonpharmacological intervention • Comparisons within nonpharmacological intervention types (e.g., comparisons of different types of exercise with each other, different types of massage with each other) • Corticosteroids, biologic drugs • Salicylates (oral and topical) • Topical menthol preparations • Others not listed for inclusion
Outcomes	**All KQs:** Primary efficacy outcomes; we will focus on outcomes from validated measures for • Function/disability/pain interference[d] • Pain[d] Harms and Adverse effects Secondary outcomes • Psychological distress (including measures of depression and anxiety) • Quality of life • Opioid use • Sleep quality, sleep disturbance • Health care utilization	**All KQs:** • Intermediate outcomes (e.g., biomarkers for inflammation) • Other nonclinical outcomes

PICOTS	Inclusion	Exclusion
Timing	Duration of followup: short term (1 to <6 months), intermediate term (≥6 to <12 months) and long term (≥12 months); focus on longer term (>12 month) effects. Trials lasting ≥6 months that include a supervised intervention followed by continued home treatment as part of the intervention will be included even though the only followup occurs directly after the intervention.	• Studies with <1 month followup after treatment
Studies	Randomized controlled trials or high-quality systematic reviews of randomized controlled trials published in English; cross-over trials with random assignment of initial treatment will be considered.	**All KQs:** • Studies reporting on intermediate outcomes only • Nonrandomized studies • Abstracts, editorials, letters, conference proceedings • Duplicate publications of the same study that do not report on different outcomes • Single site reports from multicenter trials • White papers • Narrative reviews • Articles identified as preliminary reports when results are published in later versions • Indirect comparisons • Studies with fewer than 15 patients per treatment arm • Systematic reviews on treatment of chronic neck pain, fibromyalgia, chronic headache, or osteoarthritis that are of low methodological quality. Those that do not report outcomes or time frames of interest may be excluded. Systematic reviews may be excluded based on currency or relevance (e.g., if there is a substantial new body of evidence reflected in a later review).
Settings	Any nonhospital setting or in self-directed care	• Hospital care, hospice care, emergency department care

CBD = cannabidiol; FDA = Food and Drug Administration; KQ = Key Question; MAOI = monoamine oxidase inhibitor; NSAID = nonsteroidal anti-inflammatory drug; SNRI = serotonin and norepinephrine reuptake inhibitor; SSRI = selective serotonin reuptake inhibitor; TCA = tricyclic antidepressant; THC = tetrahydrocannabinol.

[a] Multidisciplinary rehabilitation (MDR) (also known as interdisciplinary rehabilitation), is defined as a coordinated program with biopsychosocial treatment components (e.g., exercise therapy and cognitive-behavioral therapy) provided by professionals from at least two different specialties. Functional restoration training is included as part of MDR.

[b] Different forms of exercise will not be compared to each other. Exercise will be compared with nonexercise interventions for low back pain, neck pain, fibromyalgia and osteoarthritis

[c] Different forms of biofeedback will not be compared to each other. Biofeedback will be compared with the noninvasive interventions for chronic headache

[d] The magnitude of effects for pain and function will be classified using the same system as in the AHRQ-funded noninvasive treatment for low back pain review recognizing that small effects using this system may not meet standard thresholds for clinically meaningful effects. A small effect was defined for pain as a mean between-group difference following treatment of 5 to 10 points on a 0- to 100-point visual analog scale (VAS), 0.5 to 1.0 points on a 0- to 10-point numeric rating scale, or equivalent; for function as a mean difference of 5- to 10-point difference on the 0- to 100-point Oswestry Disability Index (ODI) or 1 to 2 points on the 0- to 24-point Roland-Morris Disability Questionnaire (RDQ), or equivalent; and for any outcome as a standardized mean difference (SMD) of 0.2 to 0.5. A moderate effect was defined for pain as a mean difference of 10 to 20 points on a 0- to 100-point VAS, for function as a mean difference of 10 to 20 points on the ODI or 2 to 5 points on the RDQ, and for any outcome as an SMD of 0.5 to 0.8. Large/substantial effects were defined as greater than moderate. We will apply similar methodology to outcomes measures for the other condition. The clinical relevance of effects classified as small might vary for individual patients depending on preferences, baseline symptom severity, harms, cost, and other factors.

Appendix C. Included Studies List

1. Alqualo-Costa R, Rampazo EP, Thome GR, et al. Interferential current and photobiomodulation in knee osteoarthritis: A randomized, placebo-controlled, double-blind clinical trial. Clinical Rehabilitation. 2021 Apr 26:2692155211012004. doi: https://dx.doi.org/10.1177/02692155211012004. PMID: 33896234.

2. Ashar YK, Gordon A, Schubiner H, et al. Effect of Pain Reprocessing Therapy vs Placebo and Usual Care for Patients With Chronic Back Pain: A Randomized Clinical Trial. JAMA Psychiatry. 2021 Sep 29doi: 10.1001/jamapsychiatry.2021.2669. PMID: 34586357.

3. Bernal-Utrera C, Gonzalez-Gerez JJ, Anarte-Lazo E, et al. Manual therapy versus therapeutic exercise in non-specific chronic neck pain: a randomized controlled trial. Trials [Electronic Resource]. 2020 Jul 28;21(1):682. doi: https://dx.doi.org/10.1186/s13063-020-04610-w. PMID: 32723399.

4. Bravo C, Skjaerven LH, Espart A, et al. Basic Body Awareness Therapy in patients suffering from fibromyalgia: a randomized clinical trial. Physiotherapy theory and practice. 2019;35(10):919-29. PMID: CN-01980930.

5. Coste J, Medkour T, Maigne JY, et al. Osteopathic medicine for fibromyalgia: a sham-controlled randomized clinical trial. Therapeutic Advances in Musculoskeletal Disease. 2021;13:1759720X211009017. doi: https://dx.doi.org/10.1177/1759720X211009017. PMID: 33948127.

6. Garrido-Ardila EM, Gonzalez-Lopez-Arza MV, Jimenez-Palomares M, et al. Effectiveness of acupuncture vs. core stability training in balance and functional capacity of women with fibromyalgia: a randomized controlled trial. Clinical Rehabilitation. 2020 May;34(5):630-45. doi: https://dx.doi.org/10.1177/0269215520911992. PMID: 32204612.

7.* Garrido-Ardila EM, Gonzalez-Lopez-arza MV, Jimenez-Palomares M, et al. Effects of physiotherapy vs. Acupuncture in quality of life, pain, stiffness, difficulty to work and depression of women with fibromyalgia: a randomized controlled trial. Journal of clinical medicine. 2021;10(17) PMID: 34501213.

8. Groessl EJ, Liu L, Schmalzl L, et al. Secondary Outcomes from a Randomized Controlled Trial of Yoga for Veterans with Chronic Low-Back Pain. Int J Yoga Therap. 2020 Jan 1;30(1):69-76. doi: 10.17761/2020-D-19-00036. PMID: 31509451.

9. Hu X, Lai Z, Wang L. Effects of Taichi exercise on knee and ankle proprioception among individuals with knee osteoarthritis. Research in Sports Medicine. 2020 Apr-Jun;28(2):268-78. doi: https://dx.doi.org/10.1080/15438627.2019.1663520. PMID: 31524502.

10. Joyce C, Roseen EJ, Keysor JJ, et al. Can Yoga or Physical Therapy for Chronic Low Back Pain Improve Depression and Anxiety Among Adults From a Racially Diverse, Low-Income Community? A Secondary Analysis of a Randomized Controlled Trial. Archives of Physical Medicine & Rehabilitation. 2021 Jun;102(6):1049-58. doi: https://dx.doi.org/10.1016/j.apmr.2021.01.072. PMID: 33556352.

11. Karakas A, Dilek B, Sahin MA, et al. The effectiveness of pulsed ultrasound treatment on pain, function, synovial sac thickness and femoral cartilage thickness in patients with knee osteoarthritis: a randomized, double-blind clinical, controlled study. Clinical Rehabilitation. 2020 Dec;34(12):1474-84. doi: https://dx.doi.org/10.1177/0269215520942953. PMID: 32715744.

12. Kholoosy L, Elyaspour D, Akhgari MR, et al. Evaluation of the Therapeutic Effect of Low Level Laser in Controlling Low Back Pain: A Randomized Controlled Trial. Journal of Lasers in Medical Sciences. 2020;11(2):120-5. doi: https://dx.doi.org/10.34172/jlms.2020.21. PMID: 32273951.

13. Kobayashi D, Shimbo T, Hayashi H, et al. Shiatsu for chronic lower back pain: Randomized controlled study. Complementary Therapies in Medicine. 2019 Aug;45:33-7. doi: https://dx.doi.org/10.1016/j.ctim.2019.05.019. PMID: 31331579.

14. Lam WC, Au KY, Qin Z, et al. Superficial needling acupuncture versus sham acupuncture for knee osteoarthritis: a randomized controlled trial. American Journal of Medicine. 2021 Jun 11;11:11. doi: https://dx.doi.org/10.1016/j.amjmed.2021.05.002. PMID: 34126097.

15. Lang AE, Hendrick PA, Clay L, et al. A randomized controlled trial investigating effects of an individualized pedometer driven walking program on chronic low back pain. BMC Musculoskeletal Disorders. 2021 Feb 19;22(1):206. doi: https://dx.doi.org/10.1186/s12891-021-04060-8. PMID: 33607979.

16. Luo Y, Yang M, Liu T, et al. Effect of hand-ear acupuncture on chronic low-back pain: a randomized controlled trial. Journal of traditional chinese medicine = chung i tsa chih ying wen pan. 2019;39(4):587-98. PMID: CN-02144857.

17.* Marshall A, Joyce CT, Tseng B, et al. Changes in Pain Self-Efficacy, Coping Skills and Fear Avoidance Beliefs in a Randomized Controlled Trial of Yoga, Physical Therapy, and Education for Chronic Low Back Pain. Pain medicine. 2021 PMID: 34698869.

18. McCrae CS, Curtis AF, Miller MB, et al. Effect of cognitive behavioural therapy on sleep and opioid medication use in adults with fibromyalgia and insomnia. Journal of Sleep Research. 2020 12;29(6):e13020. doi: https://dx.doi.org/10.1111/jsr.13020. PMID: 32126156.

19. Messier SP, Mihalko SL, Beavers DP, et al. Effect of High-Intensity Strength Training on Knee Pain and Knee Joint Compressive Forces Among Adults With Knee Osteoarthritis: The START Randomized Clinical Trial. JAMA. 2021 02 16;325(7):646-57. doi: https://dx.doi.org/10.1001/jama.2021.0411. PMID: 33591346.

20. Michalsen A, Jeitler M, Kessler CS, et al. Yoga, Eurythmy Therapy and Standard Physiotherapy (YES-Trial) for Patients With Chronic Non-specific Low Back Pain: A Three-Armed Randomized Controlled Trial. Journal of Pain. 2021 Apr 20;20:20. doi: https://dx.doi.org/10.1016/j.jpain.2021.03.154. PMID: 33892154.

21. Munukka M, Waller B, Hakkinen A, et al. Effects of progressive aquatic resistance training on symptoms and quality of life in women with knee osteoarthritis: A secondary analysis. Scandinavian Journal of Medicine & Science in Sports. 2020 Jun;30(6):1064-72. doi: https://dx.doi.org/10.1111/sms.13630. PMID: 31999876.

22. Neyaz O, Sumila L, Nanda S, et al. Effectiveness of Hatha Yoga Versus Conventional Therapeutic Exercises for Chronic Nonspecific Low-Back Pain. Journal of Alternative & Complementary Medicine. 2019 Sep;25(9):938-45. doi: https://dx.doi.org/10.1089/acm.2019.0140. PMID: 31347920.

23.* Park J, Herron C. Effects of a Movement-Based Mind-Body Intervention in Managing Symptoms in Older Adults with Osteoarthritis: gender, Age, and Living Arrangement Differences. Alternative & complementary therapies. 2021;27(3):111-23.

24. Patru S, Padureanu R, Dumitrescu F, et al. Influence of multidisciplinary therapeutic approach on fibromyalgia patients. Experimental & Therapeutic Medicine. 2021 May;21(5):528. doi: https://dx.doi.org/10.3892/etm.2021.9960. PMID: 33815601.

25. Pehlivan S, Karadakovan A. Effects of aromatherapy massage on pain, functional state, and quality of life in an elderly individual with knee osteoarthritis. Japan journal of nursing science. 2019;16(4):450-8. PMID: CN-02078086 NEW.

26. Perez-Aranda A, Feliu-Soler A, Montero-Marin J, et al. A randomized controlled efficacy trial of mindfulness-based stress reduction compared with an active control group and usual care for fibromyalgia: the EUDAIMON study. Pain. 2019 11;160(11):2508-23. doi: https://dx.doi.org/10.1097/j.pain.0000000000001655. PMID: 31356450.

27.* Reichenbach S, Juni P, Hincapie CA, et al. Effect of transcutaneous electrical nerve stimulation (TENS) on knee pain and physical function in patients with symptomatic knee osteoarthritis: the ETRELKA randomized clinical trial. Osteoarthritis and cartilage. 2021 PMID: 34826572.

28. Rewald S, Lenssen AFT, Emans PJ, et al. Aquatic Cycling Improves Knee Pain and Physical Functioning in Patients With Knee Osteoarthritis: A Randomized Controlled Trial. Archives of Physical Medicine & Rehabilitation. 2020 08;101(8):1288-95. doi: https://dx.doi.org/10.1016/j.apmr.2019.12.023. PMID: 32169459.

29. Roseen EJ, Gerlovin H, Femia A, et al. Yoga, Physical Therapy, and Back Pain Education for Sleep Quality in Low-Income Racially Diverse Adults with Chronic Low Back Pain: a Secondary Analysis of a Randomized Controlled Trial. Journal of General Internal Medicine. 2020 01;35(1):167-76. doi: https://dx.doi.org/10.1007/s11606-019-05329-4. PMID: 31667747.

30. Shariat A, Alizadeh R, Moradi V, et al. The impact of modified exercise and relaxation therapy on chronic lower back pain in office workers: a randomized clinical trial. Journal of Exercise Rehabilitation. 2019 Oct;15(5):703-8. doi: https://dx.doi.org/10.12965/jer.1938490.245. PMID: 31723560.

31.* Soleymani A, Arani AM, Raeissadat SA, et al. Rumination-focused cognitive-behavioral therapy for chronic low back pain: a randomized controlled trial. Galen medical journal. 2021;9 PMID: 34466577.

32. Thomas JS, Clark BC, Russ DW, et al. Effect of Spinal Manipulative and Mobilization Therapies in Young Adults With Mild to Moderate Chronic Low Back Pain: A Randomized Clinical Trial. JAMA Network Open. 2020 08 03;3(8):e2012589. doi: https://dx.doi.org/10.1001/jamanetworkopen.2020.12589. PMID: 32756930.

33. Xiao CM, Li JJ, Kang Y, et al. Follow-up of a Wuqinxi exercise at home programme to reduce pain and improve function for knee osteoarthritis in older people: a randomised controlled trial. Age & Ageing. 2021 02 26;50(2):570-5. doi: https://dx.doi.org/10.1093/ageing/afaa179. PMID: 32931545.

34.* Xiao Z, Li G. The effect of Wuqinxi exercises on the balance function and subjective quality of life in elderly, female knee osteoarthritis patients. American journal of translational research. 2021;13(6):6710-6. PMID: 34306416.

35. Yaksi E, Ketenci A, Baslo MB, et al. Does transcutaneous electrical nerve stimulation affect pain, neuropathic pain, and sympathetic skin responses in the treatment of chronic low back pain? A randomized, placebo-controlled study. The Korean journal of pain. 2021 Apr 01;34(2):217-28. doi: https://dx.doi.org/10.3344/kjp.2021.34.2.217. PMID: 33785674.

36.* Yang CY, Tsai YA, Wu PK, et al. Pilates-based core exercise improves health-related quality of life in people living with chronic low back pain: a pilot study. Journal of bodywork and movement therapies. 2021;27:294-9. PMID: 34391248.

*Studies identified since the last surveillance report

Appendix D. Evidence Table

Shown in associated Excel files for Surveillance Report 3 at https://effectivehealthcare.ahrq.gov/products/noninvasive-nonpharm-pain-update/research.

Appendix E. Quality Assessment

Shown in associated Excel files for Surveillance Report 3 at https://effectivehealthcare.ahrq.gov/products/noninvasive-nonpharm-pain-update/research.

Appendix F. Excluded Studies List

1. Abdel-Aal NM, Elsayyad MM, Megahed AA. Short-term effect of adding graston technique to exercise program in treatment of patients with cervicogenic headache: a single-blinded, randomized controlled trial. European journal of physical & rehabilitation medicine. 2021 May 05;05:05. doi: https://dx.doi.org/10.23736/S1973-9087.21.06595-3. PMID: 33947825. **Exclusion**: Ineligible population

2. Abdelbasset WK, Nambi G, Alsubaie SF, et al. A Randomized Comparative Study between High-Intensity and Low-Level Laser Therapy in the Treatment of Chronic Nonspecific Low Back Pain. Evidence-Based Complementary & Alternative Medicine: eCAM. 2020;2020:1350281. doi: https://dx.doi.org/10.1155/2020/1350281. PMID: 33178306. **Exclusion:** Inadequate duration of followup

3. Ahmadnezhad L, Yalfani A, Gholami Borujeni B. Inspiratory Muscle Training in Rehabilitation of Low Back Pain: A Randomized Controlled Trial. Journal of Sport Rehabilitation. 2020 11 01;29(8):1151-8. doi: https://dx.doi.org/10.1123/jsr.2019-0231. PMID: 31910393. **Exclusion:** Inadequate duration of followup

4.* Aitken D, Drummen SJ, Balogun S, et al. Walk - a pilot randomized controlled trial evaluating community walking for knee osteoarthritis. Osteoarthritis and cartilage. 2021;29 PMID: CN-02274579 NEW. **Exclusion**: Ineligible study design

5. Akaltun MS, Altindag O, Turan N, et al. Efficacy of high intensity laser therapy in knee osteoarthritis: a double-blind controlled randomized study. Clinical Rheumatology. 2021 May;40(5):1989-95. doi: https://dx.doi.org/10.1007/s10067-020-05469-7. PMID: 33074393. **Exclusion:** Ineligible intervention

6. Alayat MSM, Aly THA, Elsayed AEM, et al. Correction to: Efficacy of pulsed Nd:YAG laser in the treatment of patients with knee osteoarthritis: a randomized controlled trial. Lasers in Medical Science. 2020 Oct;35(8):1875. doi: https://dx.doi.org/10.1007/s10103-020-03088-x. PMID: 32647935. **Exclusion:** Not a study

7. Alayat MSM, Atya AM, Ali MME, et al. Correction to: Long-term effect of high-intensity laser therapy in the treatment of patients with chronic low back pain: a randomized blinded placebo-controlled trial. Lasers in Medical Science. 2020 Feb;35(1):297. doi: https://dx.doi.org/10.1007/s10103-019-02926-x. PMID: 31788745. **Exclusion:** Not a study

8. Albuquerque NF, Lopes BS. Musculoskeletal applications of infrared thermography on back and neck syndromes: a systematic review. European journal of physical & rehabilitation medicine. 2021 Jun;57(3):386-96. doi: https://dx.doi.org/10.23736/S1973-9087.20.06287-5. PMID: 33111511. **Exclusion:** Systematic review used as source document

9.* Alikhajeh Y, Barabadi E, Mohammad Rahimi GR. A Comparison of 6 Weeks of Aquatic Exercise and Kinesio Taping in Patients With Chronic Nonspecific Low Back Pain. Journal of sport rehabilitation. 2021;30(1):37-42. PMID: CN-02297851 NEW. **Exclusion:** Inadequate duration of follow-up

10.* Alinaghizadeh M, Hawkins J, Abbassian A, et al. Effect of Persian acupressure (Ghamz) on Patients with Knee Osteoarthritis: A Single-Blinded Parallel Clinical Trial. Pain Management Nursing. 2021 Dec;22(6):820-7. doi: https://dx.doi.org/10.1016/j.pmn.2021.06.002. PMID: 34261600. **Exclusion:** Inadequate duration of follow-up

11. Allen KD, Woolson S, Hoenig HM, et al. Stepped Exercise Program for Patients With Knee Osteoarthritis : A Randomized Controlled Trial. Annals of Internal Medicine. 2021 03;174(3):298-307. doi: https://dx.doi.org/10.7326/M20-4447. PMID: 33370174. **Exclusion**: Ineligible intervention

12. Alrwaily M, Schneider M, Sowa G, et al. Stabilization exercises combined with

neuromuscular electrical stimulation for patients with chronic low back pain: a randomized controlled trial. Brazilian Journal of Physical Therapy. 2019 Nov - Dec;23(6):506-15. doi: https://dx.doi.org/10.1016/j.bjpt.2018.10.003. PMID: 30482602. **Exclusion:** Ineligible intervention

13. Alzayed KA, Alsaadi SM. Efficacy of Pulsed Low-Frequency Magnetic Field Therapy on Patients with Chronic Low Back Pain: A Randomized Double-Blind Placebo-Controlled Trial. Asian Spine Journal. 2020 Feb;14(1):33-42. doi: https://dx.doi.org/10.31616/asj.2019.0043. PMID: 31575112. **Exclusion:** Ineligible intervention

14. Amaral DDV, Miyamoto GC, Franco KFM, et al. Examination of a Subgroup of Patients With Chronic Low Back Pain Likely to Benefit More From Pilates-Based Exercises Compared to an Educational Booklet. Journal of Orthopaedic & Sports Physical Therapy. 2020 Apr;50(4):189-97. doi: https://dx.doi.org/10.2519/jospt.2019.8839. PMID: 31443627. **Exclusion:** Ineligible study design

15. Amaral LKB, Souza MB, Campos MGM, et al. Efficacy of conservative therapy in older people with nonspecific low back pain: A systematic review with meta-analysis and GRADE recommendations. Archives of Gerontology & Geriatrics. 2020 Sep - Oct;90:104177. doi: https://dx.doi.org/10.1016/j.archger.2020.104177. PMID: 32682168. **Exclusion:** Systematic review used as source document

16.* Amirdelfan K, Tay B, Abrecht C, et al. Non-Invasive High-Frequency Impulse Therapy for Treatment of Chronic Back Pain: a Multi-Center, Randomized, Sham-Controlled Trial. Neuromodulation. 2021;24(4):e272-e3. PMID: CN-02293846 NEW. **Exclusion:** Ineligible study design

17. An J, Ryu HK, Lyu SJ, et al. Effects of Preoperative Telerehabilitation on Muscle Strength, Range of Motion, and Functional Outcomes in Candidates for Total Knee Arthroplasty: A Single-Blind Randomized Controlled Trial. International Journal of Environmental Research & Public Health [Electronic Resource]. 2021 06 04;18(11):04. doi: https://dx.doi.org/10.3390/ijerph18116071. PMID: 34199913. **Exclusion:** Ineligible population

18. Anan T, Kajiki S, Oka H, et al. Effects of an Artificial Intelligence-Assisted Health Program on Workers With Neck/Shoulder Pain/Stiffness and Low Back Pain: Randomized Controlled Trial. JMIR MHealth and UHealth. 2021 09 24;9(9):e27535. doi: https://dx.doi.org/10.2196/27535. PMID: 34559054. **Exclusion:** Ineligible population

19. Andersen TE, Ravn SL, Armfield N, et al. Trauma-focused cognitive behavioural therapy and exercise for chronic whiplash with comorbid posttraumatic stress disorder: a randomised controlled trial. Pain. 2021 04 01;162(4):1221-32. doi: https://dx.doi.org/10.1097/j.pain.0000000000002117. PMID: 33086286. **Exclusion:** Ineligible comparator

20.* Aneis MA, Shaker HA, Fahmy EM, et al. Efect of cognitive behavior therapy in patients with chronic nonspecific low back pain. Turkish journal of physiotherapy and rehabilitation. 2021;32(3):8124-8. PMID: CN-02295057 NEW. **Exclusion:** Inadequate duration of follow-up

21. Anheyer D, Klose P, Lauche R, et al. Yoga for Treating Headaches: a Systematic Review and Meta-analysis. Journal of General Internal Medicine. 2020 03;35(3):846-54. doi: https://dx.doi.org/10.1007/s11606-019-05413-9. PMID: 31667736. **Exclusion:** Systematic review used as source document

22. Annaswamy TM, Cunniff KJ, Kroll M, et al. Lumbar Bracing for Chronic Low Back Pain: A Randomized Controlled Trial. American Journal of Physical Medicine & Rehabilitation. 2021 08 01;100(8):742-9. doi: https://dx.doi.org/10.1097/PHM.0000000000001743. PMID: 33789322. **Exclusion:** Ineligible intervention

23. Areerak K, Waongenngarm P, Janwantanakul P. Factors associated with exercise adherence to prevent or treat neck and low back pain: A systematic review. Musculoskeletal Science & Practice. 2021 04;52:102333. doi: https://dx.doi.org/10.1016/j.msksp.2021.102

333. PMID: 33529988. **Exclusion:** Systematic Review used as source document

24. Areeudomwong P, Buttagat V. Proprioceptive neuromuscular facilitation training improves pain-related and balance outcomes in working-age patients with chronic low back pain: a randomized controlled trial. Brazilian Journal of Physical Therapy. 2019 Sep - Oct;23(5):428-36. doi: https://dx.doi.org/10.1016/j.bjpt.2018.10.005. PMID: 30361077. **Exclusion:** Inadequate duration of followup

25. Arguisuelas MD, Lison JF, Domenech-Fernandez J, et al. Effects of myofascial release in erector spinae myoelectric activity and lumbar spine kinematics in non-specific chronic low back pain: randomized controlled trial. Clinical biomechanics. 2019;63:27-33. PMID: CN-01707030. **Exclusion:** Inadequate duration of followup

26.* Ariana M, Afrasiabifar A, Najafi Doulatabad S, et al. The Effect of Local Heat Therapy versus Cold Rub Gel on Pain and Joint Functions in Patients with Knee Osteoarthritis. Clinical nursing research. 10547738211035502p. 2021 PMID: CN-02302677 NEW. **Exclusion:** Inadequate duration of follow-up

27. Atalay SG, Durmus A, Gezginaslan O. The Effect of Acupuncture and Physiotherapy on Patients with Knee Osteoarthritis: A Randomized Controlled Study. Pain Physician. 2021 May;24(3):E269-E78. PMID: 33988943. **Exclusion:** Ineligible comparator

28. Avellanet M, Boada-Pladellorens A, Pages E, et al. A Comparative Study of a Novel Postural Garment Versus Exercise for Women with Nonspecific Cervical Pain: A Randomized Cross-over Trial. Spine. 2021 Nov 15;46(22):1517-24. doi: https://dx.doi.org/10.1097/BRS.0000000000004123. PMID: 34292213. **Exclusion:** Ineligible population

29. Avendano-Coy J, Comino-Suarez N, Grande-Munoz J, et al. Extracorporeal shockwave therapy improves pain and function in subjects with knee osteoarthritis: A systematic review and meta-analysis of randomized clinical trials. International Journal Of Surgery. 2020 Oct;82:64-75. doi: https://dx.doi.org/10.1016/j.ijsu.2020.07.055. PMID: 32798759. **Exclusion:** Systematic review used as source document

30. Bakken AG, Eklund A, Warnqvist A, et al. The effect of two weeks of spinal manipulative therapy and home stretching exercises on pain and disability in patients with persistent or recurrent neck pain; a randomized controlled trial. BMC Musculoskeletal Disorders. 2021 Oct 27;22(1):903. doi: https://dx.doi.org/10.1186/s12891-021-04772-x. PMID: 34706706. **Exclusion:** Inadequate duration of followup

31. Barassi G, Supplizi M, Prosperi L, et al. Dual-wavelength high-power laser therapy and neuromuscular manual therapy in chronic neck pain: a randomized clinical trial. Journal of Biological Regulators & Homeostatic Agents. 2021 Mar-Apr;35(2):767-73. doi: https://dx.doi.org/10.23812/21-37-L. PMID: 33902272. **Exclusion:** Ineligible study design

32. Batistella CE, Bidin F, Giacomelli I, et al. Effects of the Russian current in the treatment of low back pain in women: A randomized clinical trial. Journal of Bodywork & Movement Therapies. 2020 Apr;24(2):118-22. doi: https://dx.doi.org/10.1016/j.jbmt.2019.10.009. PMID: 32507136. **Exclusion:** Ineligible study design

33. Bauer CM, Kankaanpaa MJ, Meichtry A, et al. Efficacy of six months neuromuscular exercise on lumbar movement variability - A randomized controlled trial. Journal of Electromyography & Kinesiology. 2019 Oct;48:84-93. doi: https://dx.doi.org/10.1016/j.jelekin.2019.06.008. PMID: 31252284. **Exclusion:** Ineligible outcomes

34. Baumeister H, Paganini S, Sander LB, et al. Effectiveness of a Guided Internet- and Mobile-Based Intervention for Patients with Chronic Back Pain and Depression (WARD-BP): A Multicenter, Pragmatic Randomized Controlled Trial. Psychotherapy & Psychosomatics. 2021;90(4):255-68. doi: https://dx.doi.org/10.1159/000511881. PMID: 33321501. **Exclusion:** Ineligible intervention

35. Bellomo TR, Schrepf A, Kruger GH, et al. Pressure Pain Tolerance Predicts the

Success of Emotional Awareness and Expression Therapy in Patients With Fibromyalgia. Clin J Pain. 2020 Jul;36(7):562-6. doi: 10.1097/AJP.0000000000000829. PMID: 32271184. **Exclusion:** Inadequate duration of followup

36. Beltrame R, Ronconi G, Ferrara PE, et al. Capacitive and resistive electric transfer therapy in rehabilitation: a systematic review. International Journal of Rehabilitation Research. 2020 Dec;43(4):291-8. doi: https://dx.doi.org/10.1097/MRR.0000000000000435. PMID: 32909988. **Exclusion:** Systematic review used as source document

37. Bendrik R, Kallings LV, Broms K, et al. Physical activity on prescription in patients with hip or knee osteoarthritis: A randomized controlled trial. Clinical Rehabilitation. 2021 Apr 11:2692155211008807. doi: https://dx.doi.org/10.1177/02692155211008807. PMID: 33843297. **Exclusion:** Ineligible population

38.* Bernal-utrera C, Anarte-lazo E, Gonzalez-gerez JJ, et al. Effect of combined manual therapy and therapeutic exercise protocols on the postural stability of patients with non-specific chronic neck pain. A secondary analysis of randomized controlled trial. Journal of clinical medicine. 2022;11(1) PMID: CN-02357862 NEW. **Exclusion: Ineligible study design**

39. Bernard S, Gentilcore-Saulnier E, Masse-Alarie H, et al. Is adding pelvic floor muscle training to an exercise intervention more effective at improving pain in patients with non-specific low back pain? A systematic review of randomized controlled trials. Physiotherapy. 2021 03;110:15-25. doi: https://dx.doi.org/10.1016/j.physio.2020.02.005. PMID: 32349867. **Exclusion:** Systematic review used as source document

40. Bidonde J, Busch AJ, Schachter CL, et al. Mixed exercise training for adults with fibromyalgia. Cochrane Database of Systematic Reviews. 2019(5) PMID: 00075320-100000000-11748. **Exclusion:** Systematic review used as source document

41. Bokaeian HR, Esfandiarpour F, Zahednejad S, et al. Effects of an Exercise Therapy Targeting Knee Kinetics on Pain, Function, and Gait Kinetics in Patients With Knee Osteoarthritis: A Randomized Clinical Trial. Adapted Physical Activity Quarterly. 2021 Mar 30;38(3):377-95. doi: https://dx.doi.org/10.1123/apaq.2020-0144. PMID: 33785660. **Exclusion:** Ineligible comparator

42. Boonruab J, Poonsuk P, Damjuti W, et al. Myofascial Pain Syndrome Focused on the Upper Trapezius Muscle: A Comparative Randomized Controlled Trial of the Court-Type Traditional Thai Massage versus the Thai Hermit. Journal of Evidence-based Integrative Medicine. 2021 Jan-Dec;26:2515690X211030852. doi: https://dx.doi.org/10.1177/2515690X211030852. PMID: 34293959. **Exclusion:** Inadequate duration of followup

43. Bronfort G, Haas M, Evans RL, et al. Non-invasive physical treatments for chronic/recurrent headache. Cochrane Database of Systematic Reviews. 2019(8) PMID: 00075320-100000000-01345. **Exclusion:** Systematic review used as source document

44. Bruck K, Jacobi K, Schmidt T. Fascial treatment versus manual therapy (HVLA) in patients with chronic neck pain: A randomized controlled trial. Journal of Back & Musculoskeletal Rehabilitation. 2021;34(6):997-1006. doi: https://dx.doi.org/10.3233/BMR-191731. PMID: 34092587. **Exclusion:** Inadequate duration of followup

45. Burgess DJ, Evans R, Allen KD, et al. Learning to Apply Mindfulness to Pain (LAMP): Design for a Pragmatic Clinical Trial of Two Mindfulness-Based Interventions for Chronic Pain. Pain Medicine. 2020 12 12;21(Suppl 2):S29-S36. doi: https://dx.doi.org/10.1093/pm/pnaa337. PMID: 33313730. **Exclusion:** Not a study

46. Buttagat V, Muenpan K, Wiriyasakunphan W, et al. A comparative study of Thai massage and muscle energy technique for chronic neck pain: A single-blinded randomized clinical trial. J Bodyw Mov Ther. 2021 Jul;27:647-53. doi: 10.1016/j.jbmt.2021.05.007. PMID: 34391301. **Exclusion:** Inadequate duration of followup

47. Calatayud J, Guzman-Gonzalez B, Andersen LL, et al. Effectiveness of a Group-Based

Progressive Strength Training in Primary Care to Improve the Recurrence of Low Back Pain Exacerbations and Function: A Randomised Trial. International Journal of Environmental Research & Public Health [Electronic Resource]. 2020 11 11;17(22):11. doi: https://dx.doi.org/10.3390/ijerph17228326. PMID: 33187076. **Exclusion:** Ineligible comparator

48. Callaghan MJ, Palmer E, O'Neill T. Management of patellofemoral joint osteoarthritis using biomechanical device therapy: a systematic review with meta-analysis. Systematic Reviews. 2021 06 09;10(1):173. doi: https://dx.doi.org/10.1186/s13643-021-01708-3. PMID: 34108025. **Exclusion:** Systematic review used as source document

49.* Carleton RN, Asmundson GJG, Korol SL, et al. Evaluating the efficacy of an attention modification program for patients with fibromyalgia: a randomized controlled trial. Pain. 2020 Mar;161(3):584-94. doi: 10.1097/j.pain.0000000000001746. PMID: 31693540. **Exclusion:** Ineligible intervention

50.* Carpenedo R, Al-Wardat M, Vizzolo L, et al. Ultrasound-guided pulsed radiofrequency of the saphenous nerve for knee osteoarthritis pain: a pilot randomized trial. Pain Management. 2022 Mar;12(2):181-93. doi: https://dx.doi.org/10.2217/pmt-2021-0035. PMID: 34431329. **Exclusion:** Ineligible intervention

51. Cejudo J, Garcia-Castillo FJ, Luna P, et al. Using a Mindfulness-Based Intervention to Promote Subjective Well-Being, Trait Emotional Intelligence, Mental Health, and Resilience in Women With Fibromyalgia. Frontiers in Psychology. 2019;10:2541. doi: https://dx.doi.org/10.3389/fpsyg.2019.02541. PMID: 31798502. **Exclusion:** Ineligible outcomes

52. Chao J, Jing Z, Xuehua B, et al. Effect of Systematic Exercise Rehabilitation on Patients With Knee Osteoarthritis: A Randomized Controlled Trial. Cartilage. 2020 Feb 10:1947603520903443. doi: https://dx.doi.org/10.1177/1947603520903443. PMID: 32037857. **Exclusion:** Inadequate duration of followup

53. Chen H, Wang Y, Liu C, et al. Benefits of a transtheoretical model-based program on exercise adherence in older adults with knee osteoarthritis: A cluster randomized controlled trial. Journal of Advanced Nursing. 2020 Jul;76(7):1765-79. doi: https://dx.doi.org/10.1111/jan.14363. PMID: 32202313. **Exclusion:** Ineligible comparator

54. Chen H, Zheng X, Huang H, et al. The effects of a home-based exercise intervention on elderly patients with knee osteoarthritis: a quasi-experimental study. BMC musculoskeletal disorders. 2019;20(1):160. PMID: CN-01937404. **Exclusion:** Inadequate duration of followup

55. Chen L, Li M, Fan L, et al. Optimized acupuncture treatment (acupuncture and intradermal needling) for cervical spondylosis-related neck pain: a multicenter randomized controlled trial. Pain. 2021 03 01;162(3):728-39. doi: https://dx.doi.org/10.1097/j.pain.0000000000002071. PMID: 32947547. **Exclusion:** Ineligible intervention

56. Chen PY, Song CY, Yen HY, et al. Impacts of tai chi exercise on functional fitness in community-dwelling older adults with mild degenerative knee osteoarthritis: a randomized controlled clinical trial. BMC Geriatr. 2021 Jul 31;21(1):449. doi: 10.1186/s12877-021-02390-9. PMID: 34332537. **Exclusion:** Inadequate duration of followup

57. Chen Z, Wu J, Wang X, et al. The effects of myofascial release technique for patients with low back pain: A systematic review and meta-analysis. Complementary Therapies in Medicine. 2021 Jun;59:102737. doi: https://dx.doi.org/10.1016/j.ctim.2021.102737. PMID: 33984499. **Exclusion:** Systematic review used as source document

58. Cheng CA, Chiu YW, Wu D, et al. Effectiveness of Tai Chi on fibromyalgia patients: A meta-analysis of randomized controlled trials. Complementary Therapies in Medicine. 2019 Oct;46:1-8. doi: https://dx.doi.org/10.1016/j.ctim.2019.07.007. PMID: 31519264. **Exclusion:** Systematic review used as source document

59. Cheung DST, Yeung WF, Suen LK, et al. Self-administered acupressure for knee osteoarthritis in middle-aged and older

adults: a pilot randomized controlled trial. Acupuncture in Medicine. 2020 04;38(2):75-85. doi: https://dx.doi.org/10.1177/0964528419883269. PMID: 31718229. **Exclusion:** Inadequate duration of followup

60. Cho J, Lee E, Lee S. Upper cervical and upper thoracic spine mobilization versus deep cervical flexors exercise in individuals with forward head posture: a randomized clinical trial investigating their effectiveness. Journal of back and musculoskeletal rehabilitation. 2019;32(4):595-602. PMID: CN-01977722. **Exclusion:** Inadequate duration of followup

61. Cho SJ. A Self-Efficacy Reinforcement Stretching Exercise Program for Community-Dwelling Older Women With Osteoarthritis: A Pilot Study. Rehabilitation Nursing Journal. 2021 Jan-Feb 01;46(1):11-23. doi: https://dx.doi.org/10.1097/RNJ.0000000000000290. PMID: 32932424. **Exclusion:** Ineligible study design

62. Coccetta CA, Sale P, Ferrara PE, et al. Effects of capacitive and resistive electric transfer therapy in patients with knee osteoarthritis: a randomized controlled trial. International journal of rehabilitation research. 2019;Internationale Zeitschrift fur Rehabilitationsforschung. Revue internationale de recherches de readaptation. 42(2):106-11. PMID: CN-01937563. **Exclusion:** Ineligible intervention

63. Corp N, Mansell G, Stynes S, et al. Evidence-based treatment recommendations for neck and low back pain across Europe: A systematic review of guidelines. European Journal of Pain. 2021 02;25(2):275-95. doi: https://dx.doi.org/10.1002/ejp.1679. PMID: 33064878. **Exclusion:** Systematic review used as source document

64. Corvillo I, Armijo F, Alvarez-Badillo A, et al. Efficacy of aquatic therapy for neck pain: a systematic review. International Journal of Biometeorology. 2020 Jun;64(6):915-25. doi: https://dx.doi.org/10.1007/s00484-019-01738-6. PMID: 31209599. **Exclusion:** Systematic review used as source document

65.* Costa AP, Monteiro C, Teixeira VC, et al. Correlation Between Muscle Strength and Functional Improvement After a Neuromuscular Electrical Strengthening Associated with Undenatured Type II Collagen in Knee Osteoarthritis. SN comprehensive clinical medicine. 2021;3(5):1122-32. PMID: CN-02273783 NEW. **Exclusion:** Ineligible intervention

66.* da Silva JM, de Barros BS, Almeida GJ, et al. Dosage of resistance exercises in fibromyalgia: evidence synthesis for a systematic literature review up-date and meta-analysis. Rheumatology International. 2022 03;42(3):413-29. doi: https://dx.doi.org/10.1007/s00296-021-05025-9. PMID: 34652480. **Exclusion:** Systematic review, not directly used

67. Dailey DL, Vance CGT, Rakel BA, et al. Transcutaneous Electrical Nerve Stimulation Reduces Movement-Evoked Pain and Fatigue: a Randomized, Controlled Trial. Arthritis & rheumatology (hoboken, N.J.). 2020;72(5):824-36. PMID: CN-02006043. **Exclusion:** Inadequate duration of followup

68. Daneau C, Cantin V, Descarreaux M. Effect of Massage on Clinical and Physiological Variables During Muscle Fatigue Task in Participants With Chronic Low Back Pain: a Crossover Study. Journal of manipulative and physiological therapeutics. 2019;42(1):55-65. PMID: CN-02001930. **Exclusion:** Ineligible study design

69. Dantas LO, Osani MC, Bannuru RR. Therapeutic ultrasound for knee osteoarthritis: A systematic review and meta-analysis with grade quality assessment. Brazilian Journal of Physical Therapy. 2021 Nov-Dec;25(6):688-97. doi: https://dx.doi.org/10.1016/j.bjpt.2021.07.003. PMID: 34535411. **Exclusion:** Systematic Review used as source document

70.* Darnall BD, Roy A, Chen AL, et al. Comparison of a Single-Session Pain Management Skills Intervention with a Single-Session Health Education Intervention and 8 Sessions of Cognitive Behavioral Therapy in Adults with Chronic Low Back Pain: a Randomized Clinical Trial. JAMA network open. 2021 PMID: CN-02305928 NEW. **Exclusion:** Ineligible comparator

71. de Campos TF, Pocovi NC, Maher CG, et al. An individualised self-management exercise and education program did not prevent recurrence of low back pain but may reduce care seeking: a randomised trial. Journal of

Physiotherapy. 2020 Jul;66(3):166-73. doi: https://dx.doi.org/10.1016/j.jphys.2020.06.006. PMID: 32709590. **Exclusion:** Ineligible population

72. Deer TR, Esposito MF, McRoberts WP, et al. A Systematic Literature Review of Peripheral Nerve Stimulation Therapies for the Treatment of Pain. Pain Medicine. 2020 08 01;21(8):1590-603. doi: https://dx.doi.org/10.1093/pm/pnaa030. PMID: 32803220. **Exclusion:** Systematic review used as source document

73. Dharmasri CJ, Griesemer I, Arbeeva L, et al. Acceptability of telephone-based pain coping skills training among African Americans with osteoarthritis enrolled in a randomized controlled trial: a mixed methods analysis. BMC Musculoskeletal Disorders. 2020 Aug 14;21(1):545. doi: https://dx.doi.org/10.1186/s12891-020-03578-7. PMID: 32795282. **Exclusion:** Ineligible study design

74. Didehdar D, Kamali F, Yoosefinejad AK, et al. The effect of spinal manipulation on brain neurometabolites in chronic nonspecific low back pain patients: a randomized clinical trial. Irish Journal of Medical Science. 2020 May;189(2):543-50. doi: https://dx.doi.org/10.1007/s11845-019-02140-2. PMID: 31773541. **Exclusion:** Ineligible study design

75. Domingues L, Pimentel-Santos FM, Cruz EB, et al. Is a combined programme of manual therapy and exercise more effective than usual care in patients with non-specific chronic neck pain? A randomized controlled trial. Clinical Rehabilitation. 2019 Dec;33(12):1908-18. doi: https://dx.doi.org/10.1177/0269215519876675. PMID: 31549519. **Exclusion:** Ineligible intervention

76. Dowsey M, Castle D, Knowles S, et al. The effect of mindfulness training prior to total joint arthroplasty on post-operative pain and physical function: A randomised controlled trial. Complementary Therapies in Medicine. 2019 Oct;46:195-201. doi: https://dx.doi.org/10.1016/j.ctim.2019.08.010. PMID: 31519279. **Exclusion:** Ineligible population

77. Duarte N, Santos C, Hughes SL, et al. Feasibility and impact of Fit & Strong! Program in Portuguese older adults with osteoarthritis: a pilot randomized controlled trial. Geriatric nursing (New York, N.Y.). 2020;41(6):804-11. PMID: CN-02139995. **Exclusion**: Ineligible population

78.* Ebadi S, Alishahi V, Ahadi T, et al. Acupuncture-like versus conventional transcutaneous electrical nerve stimulation in the management of active myofascial trigger points: A randomized controlled trial. Journal of Bodywork & Movement Therapies. 2021 10;28:483-8. doi: https://dx.doi.org/10.1016/j.jbmt.2021.06.016. PMID: 34776182. Exclusion: **Ineligible population**

79. Ehsani F, Hedayati R, Bagheri R, et al. The Effects of Stabilization Exercise on the Thickness of Lateral Abdominal Muscles During Standing Tasks in Women With Chronic Low Back Pain: A Randomized Triple-Blinded Clinical Trial Study. Journal of Sport Rehabilitation. 2020 Sep 01;29(7):942-51. doi: https://dx.doi.org/10.1123/jsr.2019-0058. PMID: 31821992. **Exclusion:** Ineligible comparator

80. Elshiwi AM, Hamada HA, Mosaad D, et al. Effect of pulsed electromagnetic field on nonspecific low back pain patients: a randomized controlled trial. Brazilian journal of physical therapy. 2019;23(3):244-9. PMID: CN-01628986. **Exclusion:** Inadequate duration of followup

81. Estevez-Lopez F, Maestre-Cascales C, Russell D, et al. Effectiveness of Exercise on Fatigue and Sleep Quality in Fibromyalgia: A Systematic Review and Meta-analysis of Randomized Trials. Archives of Physical Medicine & Rehabilitation. 2021 04;102(4):752-61. doi: https://dx.doi.org/10.1016/j.apmr.2020.06.019. PMID: 32721388. **Exclusion:** Systematic review used as source document

82.* Fail LB, Marinho DA, Marques EA, et al. Benefits of aquatic exercise in adults with and without chronic disease-A systematic review with meta-analysis. Scandinavian Journal of Medicine & Science in Sports. 2022 Mar;32(3):465-86. doi: https://dx.doi.org/10.1111/sms.14112. PMID: 34913530. **Exclusion:** Systematic review, not directly used

83. Fan Y, Li Z, Zhang H, et al. Valgus knee bracing may have no long-term effect on

pain improvement and functional activity in patients with knee osteoarthritis: a meta-analysis of randomized trials. Journal of Orthopaedic Surgery. 2020 Sep 01;15(1):373. doi: https://dx.doi.org/10.1186/s13018-020-01917-x. PMID: 32873332. **Exclusion:** Systematic review used as source document

84. Fernandez-Carnero J, Sierra-Silvestre E, Beltran-Alacreu H, et al. Neural Tension Technique Improves Immediate Conditioned Pain Modulation in Patients with Chronic Neck Pain: A Randomized Clinical Trial. Pain Medicine. 2019 06 01;20(6):1227-35. doi: https://dx.doi.org/10.1093/pm/pny115. PMID: 29945245. **Exclusion:** Inadequate duration of followup

85. Ferreira RM, Torres RT, Duarte JA, et al. Non-Pharmacological and Non-Surgical Interventions for Knee Osteoarthritis: A Systematic Review and Meta-Analysis. Acta Reumatologica Portuguesa. 2019 07 29;44(3):173-217. PMID: 31356585. **Exclusion:** Systematic review used as source document

86. Ferro Moura Franco K, Lenoir D, Dos Santos Franco YR, et al. Prescription of exercises for the treatment of chronic pain along the continuum of nociplastic pain: A systematic review with meta-analysis. European Journal of Pain. 2021 01;25(1):51-70. doi: https://dx.doi.org/10.1002/ejp.1666. PMID: 32976664. **Exclusion:** Systematic review used as source document

87. Fertelli TK, Mollaoglu M, Sahin O. Aquatic Exercise Program for Individuals With Osteoarthritis: pain, Stiffness, Physical Function, Self-Efficacy. Rehabilitation nursing. 2019 Sep/Oct;44(5):290-9. doi: 10.1097/rnj.0000000000000142. PMID: 29613876. **Exclusion:** Inadequate duration of followup

88. Fisher LR, Alvar BA, Maher SF, et al. Short-term Effects of Thoracic Spine Thrust Manipulation, Exercise, and Education in Individuals With Low Back Pain: A Randomized Controlled Trial. Journal of Orthopaedic & Sports Physical Therapy. 2020 Jan;50(1):24-32. doi: https://dx.doi.org/10.2519/jospt.2020.8928. PMID: 31810405. **Exclusion:** Inadequate duration of followup

89. Fonseca ACS, Faria PC, Alcantara MA, et al. Effects of aquatic physiotherapy or health education program in women with fibromyalgia: a randomized clinical trial. Physiotherapy Theory & Practice. 2021 May;37(5):620-32. doi: https://dx.doi.org/10.1080/09593985.2019.1639229. PMID: 31305209. **Exclusion:** Inadequate duration of followup

90. Foo CN, Arumugam M, Lekhraj R, et al. Effectiveness of Health-Led Cognitive Behavioral-Based Group Therapy on Pain, Functional Disability and Psychological Outcomes among Knee Osteoarthritis Patients in Malaysia. International Journal of Environmental Research & Public Health [Electronic Resource]. 2020 08 26;17(17):26. doi: https://dx.doi.org/10.3390/ijerph17176179. PMID: 32858791. **Exclusion:** Ineligible intervention

91. Foster NE, Vertosick EA, Lewith G, et al. Identifying patients with chronic pain who respond to acupuncture: results from an individual patient data meta-analysis. Acupuncture in Medicine. 2021 04;39(2):83-90. doi: https://dx.doi.org/10.1177/0964528420920303. PMID: 32571096. **Exclusion:** Systematic review used as source document

92. Fraenkel L, Buta E, Suter L, et al. Nonsteroidal Anti-inflammatory Drugs vs Cognitive Behavioral Therapy for Arthritis Pain: A Randomized Withdrawal Trial. JAMA Internal Medicine. 2020 09 01;180(9):1194-202. doi: https://dx.doi.org/10.1001/jamainternmed.2020.2821. PMID: 32702101**. Exclusion:** Ineligible intervention

93. Francescato Torres S, Brandt de Macedo AC, Dias Antunes M, et al. Effects of electroacupuncture frequencies on chronic low back pain in older adults: triple-blind, 12-months protocol for a randomized controlled trial. Trials [Electronic Resource]. 2019 Dec 23;20(1):762. doi: https://dx.doi.org/10.1186/s13063-019-3813-6. PMID: 31870456. **Exclusion:** Not a study

94. Frutiger M, Borotkanics R. Systematic Review and Meta-Analysis Suggest Strength Training and Workplace Modifications May Reduce Neck Pain in Office Workers. Pain

Practice. 2021 01;21(1):100-31. doi: https://dx.doi.org/10.1111/papr.12940. PMID: 32657531. **Exclusion:** Systematic review used as source document

95. Furukawa Y. Tasuki for neck pain: An individually-randomized, open-label, waiting-list-controlled trial. Journal of Occupational Health. 2020 Jan;62(1):e12097. doi: https://dx.doi.org/10.1002/1348-9585.12097. PMID: 31705728. **Exclusion:** Ineligible intervention

96. Galvao-Moreira LV, de Castro LO, Moura ECR, et al. Pool-based exercise for amelioration of pain in adults with fibromyalgia syndrome: A systematic review and meta-analysis. Modern Rheumatology. 2021 Jul;31(4):904-11. doi: https://dx.doi.org/10.1080/14397595.2020.1829339. PMID: 32990113. **Exclusion:** Systematic review used as source document

97. Garijo IH, Del Barrio SJ, Gomez TM, et al. Effectiveness of non-pharmacological conservative therapies in adults with fibromyalgia: A systematic review of high-quality clinical trials. Journal of Back & Musculoskeletal Rehabilitation. 2021 Jun 25;25:25. doi: https://dx.doi.org/10.3233/BMR-200282. PMID: 34180405. **Exclusion:** Systematic review used as source document

98. Gati T, Czimer E, Cserhati G, et al. A multicentre randomized controlled follow-up study of the effects of the underwater traction therapy in chronic low back pain. International Journal of Biometeorology. 2020 Aug;64(8):1393-400. doi: https://dx.doi.org/10.1007/s00484-020-01919-8. PMID: 32361959. **Exclusion:** Ineligible intervention

99. Godley E, Smith MA. Efficacy of acupressure for chronic low back pain: A systematic review. Complementary Therapies in Clinical Practice. 2020 May;39:101146. doi: https://dx.doi.org/10.1016/j.ctcp.2020.101146. PMID: 32379678. **Exclusion:** Systematic review used as source document

100. Gohir SA, Eek F, Kelly A, et al. Effectiveness of Internet-Based Exercises Aimed at Treating Knee Osteoarthritis: The iBEAT-OA Randomized Clinical Trial. JAMA Network Open. 2021 02 01;4(2):e210012. doi: https://dx.doi.org/10.1001/jamanetworkopen.2021.0012. PMID: 33620447. **Exclusion:** Inadequate duration of followup

101. Gomez-de-Regil L, Estrella-Castillo DF. Psychotherapy for Physical Pain in Patients with Fibromyalgia: A Systematic Review. Pain Research & Management. 2020;2020:3408052. doi: https://dx.doi.org/10.1155/2020/3408052. PMID: 32714478. **Exclusion:** Systematic review used as source document

102. Gonzalez-Rueda V, Hidalgo-Garcia C, Rodriguez-Sanz J, et al. Does Upper Cervical Manual Therapy Provide Additional Benefit in Disability and Mobility over a Physiotherapy Primary Care Program for Chronic Cervicalgia? A Randomized Controlled Trial. International Journal of Environmental Research & Public Health [Electronic Resource]. 2020 11 11;17(22):11. doi: https://dx.doi.org/10.3390/ijerph17228334. PMID: 33187167. **Exclusion:** Ineligible intervention

103. Gonzalez-Rueda V, Lopez-de-Celis C, Bueno-Gracia E, et al. "Short- and mid-term effects of adding upper cervical manual therapy to a conventional physical therapy program in patients with chronic mechanical neck pain. Randomized controlled clinical trial.". Clinical Rehabilitation. 2021 Mar;35(3):378-89. doi: https://dx.doi.org/10.1177/0269215520965054. PMID: 33076707. **Exclusion:** Ineligible intervention

104. Gopichandran L, Srivastsava AK, Vanamail P, et al. Effectiveness of Progressive Muscle Relaxation and Deep Breathing Exercise on Pain, Disability, and Sleep Among Patients With Chronic Tension-Type Headache: A Randomized Control Trial. Holistic Nursing Practice. 2021 May 28;28:28. doi: https://dx.doi.org/10.1097/HNP.0000000000000460. PMID: 34054116. **Exclusion:** Inadequate duration of followup

105. Gould HM, Atkinson JH, Chircop-Rollick T, et al. A randomized placebo-controlled trial of desipramine, cognitive behavioral therapy, and active placebo therapy for low back pain. Pain. 2020 06;161(6):1341-9. doi: https://dx.doi.org/10.1097/j.pain.000000000

0001834. PMID: 32068667. **Exclusion:** Inadequate duration of followup

106.* Groessl E, McCarthy A, Casteel D, et al. Feasibility of yoga for chronic low back and neck pain in military personnel. Global advances in health and medicine. 2021;10:16-7. PMID: CN-02276530 NEW. **Exclusion:** Ineligible study design

107. Groessl EJ, Liu L, Richard EL, et al. Cost-effectiveness of Yoga for Chronic Low Back Pain in Veterans. Medical Care. 2020 09;58 Suppl 2 9S:S142-S8. doi: https://dx.doi.org/10.1097/MLR.0000000000001356. PMID: 32826784. **Exclusion:** Ineligible outcomes

108. Gueugnon M, Fournel I, Soilly AL, et al. Effectiveness, safety, and cost-utility of a knee brace in medial knee osteoarthritis: the ERGONOMIE randomized controlled trial. Osteoarthritis & Cartilage. 2021 04;29(4):491-501. doi: https://dx.doi.org/10.1016/j.joca.2020.11.009. PMID: 33524515. **Exclusion:** Ineligible population

109. Guimaraes LS, Costa L, Araujo AC, et al. Photobiomodulation therapy is not better than placebo in patients with chronic nonspecific low back pain: a randomised placebo-controlled trial. Pain. 2021 06 01;162(6):1612-20. doi: https://dx.doi.org/10.1097/j.pain.0000000000002189. PMID: 33449509. **Exclusion:** Ineligible intervention

110. Guinot M, Maindet C, Hodaj H, et al. Effects of Repetitive Transcranial Magnetic Stimulation and Multicomponent Therapy in Patients With Fibromyalgia: A Randomized Controlled Trial. Arthritis care & research. 2021 03;73(3):449-58. doi: https://dx.doi.org/10.1002/acr.24118. PMID: 31785190.**Exclusion:** Ineligible intervention

111.* Guo D, Ma S, Zhao Y, et al. Self-administered acupressure and exercise for patients with osteoarthritis: a randomized controlled trial. Clinical rehabilitation. 2692155211049155p. 2021 PMID: CN-02346093 NEW. **Exclusion:** Inadequate duration of follow-up

112. Gutierrez Espinoza H, Araya-Quintanilla F, Olguin-Huerta C, et al. Effectiveness of manual therapy in patients with thumb carpometacarpal osteoarthritis: a systematic review and meta-analysis. Physiotherapy Theory & Practice. 2021 Jun 01:1-10. doi: https://dx.doi.org/10.1080/09593985.2021.1926026. PMID: 34074220. **Exclusion:** Systematic review used as source document

113. Hanel J, Owen PJ, Held S, et al. Effects of Exercise Training on Fear-Avoidance in Pain and Pain-Free Populations: Systematic Review and Meta-analysis. Sports Medicine. 2020 Dec;50(12):2193-207. doi: https://dx.doi.org/10.1007/s40279-020-01345-1. PMID: 32946074. **Exclusion:** Systematic review used as source document

114. Hansen S, Mikkelsen LR, Overgaard S, et al. Effectiveness of supervised resistance training for patients with hip osteoarthritis - a systematic review. Danish Medical Journal. 2020 Jun 01;67(6):01. PMID: 32741435. **Exclusion:** Systematic review used as source document

115. Harada K, Takahashi K, Ikuta F, et al. Efficacy of a deep thermal therapy system for osteoarthritis of the knee. Journal of Nippon Medical School = Nihon Ika Daigaku Zasshi. 2020 Sep 30;30:30. doi: https://dx.doi.org/10.1272/jnms.JNMS.2021_88-505. PMID: 32999179. **Exclusion:** Ineligible study design

116.* Hatefi M, Babakhani F, Ashrafizadeh M. The effect of static stretching exercises on hip range of motion, pain, and disability in patients with non-specific low back pain. Journal of experimental orthopaedics. 2021;8(1) PMID: CN-02301091 NEW. **Exclusion:** Inadequate duration of follow-up

117. Haugmark T, Hagen KB, Provan SA, et al. Effects of a mindfulness-based and acceptance-based group programme followed by physical activity for patients with fibromyalgia: a randomised controlled trial. BMJ Open. 2021 Jun 29;11(6):e046943. doi: 10.1136/bmjopen-2020-046943. PMID: 34187823. **Exclusion:** Ineligible intervention

118. Haugmark T, Hagen KB, Smedslund G, et al. Mindfulness- and acceptance-based interventions for patients with fibromyalgia - A systematic review and meta-analyses. PLoS ONE [Electronic Resource]. 2019;14(9):e0221897. doi: https://dx.doi.org/10.1371/journal.pone.0221897. PMID: 31479478. **Exclusion:** Systematic review used as source document

119. Hayden JA, Ellis J, Ogilvie R, et al. Exercise therapy for chronic low back pain. Cochrane Database of Systematic Reviews. 2021 09 28;9:CD009790. doi: https://dx.doi.org/10.1002/14651858.CD009790.pub2. PMID: 34580864. **Exclusion:** Systematic Review used as source document

120. Hayden JA, Wilson MN, Stewart S, et al. Exercise treatment effect modifiers in persistent low back pain: an individual participant data meta-analysis of 3514 participants from 27 randomised controlled trials. British Journal of Sports Medicine. 2020 Nov;54(21):1277-8. doi: https://dx.doi.org/10.1136/bjsports-2019-101205. PMID: 31780447. **Exclusion:** Systematic review used as source document

121.* He J, Ferrigno C, Shakoor N, et al. Responses to gait retraining using pressure-based auditory feedback for medial knee osteoarthritis. Osteoarthritis and cartilage. 2021;29:S81-S2. PMID: CN-02274573 NEW. **Exclusion:** Ineligible study design

122. Hee SW, Mistry D, Friede T, et al. Identification of subgroup effect with an individual participant data meta-analysis of randomised controlled trials of three different types of therapist-delivered care in low back pain. BMC Musculoskeletal Disorders. 2021 Feb 16;22(1):191. doi: https://dx.doi.org/10.1186/s12891-021-04028-8. PMID: 33593341. **Exclusion:** Systematic review used as source document

123. Hernandez D, Dimaro M, Navarro E, et al. Efficacy of core exercises in patients with osteoarthritis of the knee: A randomized controlled clinical trial. Journal of Bodywork & Movement Therapies. 2019 Oct;23(4):881-7. doi: https://dx.doi.org/10.1016/j.jbmt.2019.06.002. PMID: 31733777. **Exclusion:** Ineligible comparator

124.* Hernandez R, McCarthy A, Casteel D, et al. The association of intervention attendance with changes in pain severity in a clinical trial of yoga for veterans with clbp. Global advances in health and medicine. 2021;10:45-6. PMID: CN-02298853. **Exclusion:** Ineligible study design

125. Hernando-Garijo I, Ceballos-Laita L, Mingo-Gomez MT, et al. Immediate Effects of a Telerehabilitation Program Based on Aerobic Exercise in Women with Fibromyalgia. International Journal of Environmental Research & Public Health [Electronic Resource]. 2021 02 20;18(4):20. doi: https://dx.doi.org/10.3390/ijerph18042075. PMID: 33672691. **Exclusion:** Inadequate duration of followup

126.* Hernando-Garijo I, Jimenez-Del-Barrio S, Mingo-Gomez T, et al. Effectiveness of non-pharmacological conservative therapies in adults with fibromyalgia: A systematic review of high-quality clinical trials. Journal of Back & Musculoskeletal Rehabilitation. 2022;35(1):3-20. doi: https://dx.doi.org/10.3233/BMR-200282. PMID: 34180405. **Exclusion:** Systematic review, not directly used

127. Howarth A, Riaz M, Perkins-Porras L, et al. Pilot randomised controlled trial of a brief mindfulness-based intervention for those with persistent pain. Journal of behavioral medicine. 2019;42(6):999-1014. PMID: CN-01939048. **Exclusion:** Ineligible population

128. Hu L, Wang Y, Liu X, et al. Tai Chi exercise can ameliorate physical and mental health of patients with knee osteoarthritis: systematic review and meta-analysis. Clinical Rehabilitation. 2021 Jan;35(1):64-79. doi: https://dx.doi.org/10.1177/0269215520954343. PMID: 32954819. **Exclusion:** Systematic review used as source document

129. Huang CC, Wang HH, Chen KC, et al. Effects of a dynamic combined training on impulse response for middle-aged and elderly patients with osteoporosis and knee osteoarthritis: a randomized control trial. Aging-Clinical & Experimental Research. 2021 Jan;33(1):115-23. doi: https://dx.doi.org/10.1007/s40520-020-01508-0. PMID: 32100224. **Exclusion:** Ineligible study design

130. Huang JF, Zheng XQ, Chen D, et al. Can Acupuncture Improve Chronic Spinal Pain? A Systematic Review and Meta-Analysis. Global Spine Journal. 2020 Oct 09:2192568220962440. doi: https://dx.doi.org/10.1177/2192568220962440. PMID: 33034233. **Exclusion:** Systematic review used as source document

131. Huang Z, Liu S, Zhou J, et al. Efficacy and Safety of Acupuncture for Chronic

Discogenic Sciatica, a Randomized Controlled Sham Acupuncture Trial. Pain Medicine. 2019 11 01;20(11):2303-10. doi: https://dx.doi.org/10.1093/pm/pnz167. PMID: 31369674. **Exclusion:** Ineligible population

132. Huppe A, Zeuner C, Karstens S, et al. Feasibility and long-term efficacy of a proactive health program in the treatment of chronic back pain: a randomized controlled trial. BMC Health Services Research. 2019 Oct 21;19(1):714. doi: https://dx.doi.org/10.1186/s12913-019-4561-8. PMID: 31639016. **Exclusion:** Ineligible intervention

133. Ibanez-Vera AJ, Garcia-Romero JC, Alvero-Cruz JR, et al. Effects of Monopolar Dielectric Radiofrequency Signals on the Symptoms of Fibromyalgia: a Single-Blind Randomized Controlled Trial. International journal of environmental research and public health. 2020;17(7) PMID: CN-02098575. **Exclusion:** Inadequate duration of followup

134. Iijima H, Eguchi R, Shimoura K, et al. Transcutaneous Electrical Nerve Stimulation Improves Stair Climbing Capacity in People with Knee Osteoarthritis. Scientific Reports. 2020 04 29;10(1):7294. doi: https://dx.doi.org/10.1038/s41598-020-64176-0. PMID: 32350320. **Exclusion:** Inadequate duration of followup

135.* In TS, Jung JH, Jung KS, et al. Effects of the Multidimensional Treatment on Pain, Disability, and Sitting Posture in Patients with Low Back Pain: a Randomized Controlled Trial. Pain research & management. 2021;2021 PMID: CN-02295113 NEW. **Exclusion:** Ineligible comparator

136. Izquierdo-Alventosa R, Ingles M, Cortes-Amador S, et al. Low-Intensity Physical Exercise Improves Pain Catastrophizing and Other Psychological and Physical Aspects in Women with Fibromyalgia: A Randomized Controlled Trial. International Journal of Environmental Research & Public Health [Electronic Resource]. 2020 05 21;17(10):21. doi: https://dx.doi.org/10.3390/ijerph17103634. PMID: 32455853. **Exclusion:** Inadequate duration of followup

137. Jafarzadeh A, Ehsani F, Yosephi MH, et al. Concurrent postural training and M1 anodal transcranial direct current stimulation improve postural impairment in patients with chronic low back pain. Journal of Clinical Neuroscience. 2019 Oct;68:224-34. doi: https://dx.doi.org/10.1016/j.jocn.2019.07.017. PMID: 31350080. **Exclusion:** Ineligible study design

138.* Jamison RN, Edwards RR, Curran S, et al. Effects of wearable transcutaneous electrical nerve stimulation on fibromyalgia: a randomized controlled trial. Journal of pain research. 2265;14:2265-82. PMID: CN-02304190 NEW. **Exclusion:** Inadequate duration of follow-up

139. Jassi FJ, Del Antonio TT, Azevedo BO, et al. Star-Shape Kinesio Taping Is Not Better Than a Minimal Intervention or Sham Kinesio Taping for Pain Intensity and Postural Control in Chronic Low Back Pain: A Randomized Controlled Trial. Archives of Physical Medicine & Rehabilitation. 2021 Jul;102(7):1352-60.e3. doi: https://dx.doi.org/10.1016/j.apmr.2021.03.007. PMID: 33819489. **Exclusion:** Ineligible intervention

140.* Javdaneh N, Ambrozy T, Barati AH, et al. Focus on the scapular region in the rehabilitation of chronic neck pain is effective in improving the symptoms: a randomized controlled trial. Journal of clinical medicine. 2021;10(16) PMID: CN-02302063 NEW. **Exclusion:** Inadequate duration of follow-up

141. Javdaneh N, Molayei F, Kamranifraz N. Effect of adding motor imagery training to neck stabilization exercises on pain, disability and kinesiophobia in patients with chronic neck pain. Complementary Therapies in Clinical Practice. 2021 Feb;42:101263. doi: https://dx.doi.org/10.1016/j.ctcp.2020.101263. PMID: 33276225. **Exclusion:** Inadequate duration of followup

142. Jiao J, Russell IJ, Wang W, et al. Ba-Duan-Jin alleviates pain and fibromyalgia-related symptoms in patients with fibromyalgia: results of a randomised controlled trial. Clinical & Experimental Rheumatology. 2019 Nov-Dec;37(6):953-62. PMID: 30789154. **Exclusion:** Inadequate duration of followup

143. Kamonseki DH, Lopes EP, van der Meer HA, et al. Effectiveness of manual therapy in patients with tension-type headache. A systematic review and meta-analysis. Disability & Rehabilitation. 2020 Sep 12:1-10. doi: https://dx.doi.org/10.1080/09638288.2020.1813817. PMID: 32924640. **Exclusion:** Systematic review used as source document

144. Kang TW, Lee JH, Park DH, et al. Effects of a finger exercise program on hand function in automobile workers with hand osteoarthritis: a randomized controlled trial. Hand surgery & rehabilitation. 2019;38(1):59-66. PMID: CN-02084202 NEW. **Exclusion:** Ineligible study design

145. Kaplun A, Roitman P, Rosenbloom T. Effects of Brief Guided Imagery on Female Patients Diagnosed with Fibromyalgia: An Exploratory Controlled Trial. Alternative Therapies in Health & Medicine. 2021 Jun;27(S1):104-13. PMID: 32827404. **Exclusion:** Inadequate duration of followup

146. Karadag S, Tasci S, Dogan N, et al. Application of heat and a home exercise program for pain and function levels in patients with knee osteoarthritis: A randomized controlled trial. International Journal of Nursing Practice. 2019 Oct;25(5):e12772. doi: https://dx.doi.org/10.1111/ijn.12772. PMID: 31436359. **Exclusion:** Inadequate duration of followup

147.* Karasel S, Oncel S, Sonmez I. The Effect of Short-Wave Diathermy and Exercise on Depressive Affect in Chronic Low Back Pain Patients. Medical archives (sarajevo, bosnia and herzegovina). 2021;75(3):216-20. PMID: CN-02325248 NEW. **Exclusion:** Ineligible intervention

148.* Karimi N, Dehkordi KJ, Rizi RM. Effects of Pilates training VS. Suspension training on quality of life in women with knee osteoarthritis: a randomized controlled trial. Journal of bodywork and movement therapies. 2021;27:737-45. PMID: CN-02292679 NEW. **Exclusion:** Inadequate duration of follow-up

149.* Khosrokiani Z, Letafatkar A, Gladin A. Lumbar motor control training as a complementary treatment for chronic neck pain: A randomized controlled trial. Clinical Rehabilitation. 2022 Jan;36(1):99-112. doi: https://dx.doi.org/10.1177/02692155211038099. PMID: 34474578. **Exclusion:** Inadequate duration of follow-up

150. Kim E, Kim YS, Kim YI, et al. Effectiveness and Safety of Polydioxanone Thread-Embedding Acupuncture as an Adjunctive Therapy for Patients with Chronic Nonspecific Neck Pain: a Randomized Controlled Trial. Journal of alternative and complementary medicine (New York, N.Y.). 2019;25(4):417-26. PMID: CN-01659482. **Exclusion:** Ineligible intervention

151. Kim M, Kim J. Effects of Acupressure on Pain, Flexibility, and Substance P in Middle-Age Women with Chronic Neck Pain. Journal of Alternative & Complementary Medicine. 2021 Feb;27(2):160-7. doi: https://dx.doi.org/10.1089/acm.2020.0413. PMID: 33296258. **Exclusion:** Inadequate duration of followup

152. Kim S, Hsu FC, Groban L, et al. A pilot study of aquatic prehabilitation in adults with knee osteoarthritis undergoing total knee arthroplasty - short term outcome. BMC Musculoskeletal Disorders. 2021 Apr 26;22(1):388. doi: https://dx.doi.org/10.1186/s12891-021-04253-1. PMID: 33902505. **Exclusion:** Ineligible population

153. Kim SD. Twelve Weeks of Yoga for Chronic Nonspecific Lower Back Pain: A Meta-Analysis. Pain Management Nursing. 2020 12;21(6):536-42. doi: https://dx.doi.org/10.1016/j.pmn.2020.07.002. PMID: 32830047. **Exclusion:** Systematic review used as source document

154. Kim SH, Park KN, Kwon OY. Classification-Specific Treatment Improves Pain, Disability, Fear-Avoidance Beliefs, and Erector Spinae Muscle Activity During Walking in Patients With Low Back Pain Exhibiting Lumbar Extension-Rotation Pattern: A Randomized Controlled Trial. Journal of Manipulative & Physiological Therapeutics. 2020 02;43(2):123-33. doi: https://dx.doi.org/10.1016/j.jmpt.2019.04.004. PMID: 32312606. **Exclusion:** Ineligible comparator

155. Kim SK, Min A, Jeon C, et al. Clinical outcomes and cost-effectiveness of massage chair therapy versus basic physiotherapy in lower back pain patients: A randomized

controlled trial. Medicine. 2020 Mar;99(12):e19514. doi: https://dx.doi.org/10.1097/MD.0000000000019514. PMID: 32195952. **Exclusion:** Inadequate duration of followup

156. Kim SY, Busch AJ, Overend TJ, et al. Flexibility exercise training for adults with fibromyalgia. Cochrane Database of Systematic Reviews. 2019 Sep 02;9:CD013419. doi: https://dx.doi.org/10.1002/14651858.CD013419. PMID: 31476271. **Exclusion:** Systematic review used as source document

157. Kim T, Lee J, Oh S, et al. Effectiveness of Simulated Horseback Riding for Patients With Chronic Low Back Pain: A Randomized Controlled Trial. Journal of Sport Rehabilitation. 2020 Feb 01;29(2):179-85. doi: https://dx.doi.org/10.1123/jsr.2018-0252. PMID: 30676224. **Exclusion:** Ineligible comparator

158. Kolbe L, Eberhardt T, Leinberger B, et al. Effectiveness of Biofeedback for Primary Headache - A Randomized Controlled Study. Psychotherapie, Psychosomatik, medizinische Psychologie. 2020;70(7):300-7. PMID: CN-02073107. **Exclusion:** Not English language but possibly relevant

159. Kong JT, Puetz C, Tian L, et al. Effect of Electroacupuncture vs Sham Treatment on Change in Pain Severity Among Adults With Chronic Low Back Pain: A Randomized Clinical Trial. JAMA Network Open. 2020 10 01;3(10):e2022787. doi: https://dx.doi.org/10.1001/jamanetworkopen.2020.22787. PMID: 33107921. **Exclusion:** Inadequate duration of followup

160.* Koran S, Sang JE, Burcu P, et al. Search for the clinical effectiveness of Korean Tae-Geuk acupuncture therapy in chronic tension-type headache. Revista internacional de acupuntura. 2021;15(4) PMID: CN-02342713 NEW. **Exclusion:** Not in English, possibly relevant

161. Krauss I, Hein T, Steinhilber B, et al. A 12-week exercise program for patients with hip osteoarthritis has no influence on gait parameters: A secondary analysis of a randomized controlled trial. Gait & Posture. 2020 05;78:6-12. doi: https://dx.doi.org/10.1016/j.gaitpost.2020.03.001. PMID: 32151918. **Exclusion:** Inadequate duration of followup

162. Krishna D, Deepeshwar S, Devi B. Yoga-Based Relaxation Technique Facilitates Sustained Attention in Patients with Low Back Pain: A Pilot Study. Advances in Mind-Body Medicine. 2020 Summer;34(3):11-7. PMID: 32931457. **Exclusion:** Ineligible study design

163. Kroll LS, Callesen HE, Carlsen LN, et al. Manual joint mobilisation techniques, supervised physical activity, psychological treatment, acupuncture and patient education for patients with tension-type headache. A systematic review and meta-analysis. Journal of Headache & Pain. 2021 Aug 21;22(1):96. doi: https://dx.doi.org/10.1186/s10194-021-01298-4. PMID: 34418953. **Exclusion:** Systematic Review used as source document

164.* Kukiat T, Kiattisin K, Sumalai K-A, et al. Star Excursion Balance Test as an Exercise to Improve Static and Dynamic Balance in Community-Dwelling Persons with Unilateral Osteoarthritis of Knee. Indian journal of physiotherapy & occupational therapy. 2021;15(2):30-6. PMID: CN-02308779 NEW. **Exclusion:** Ineligible study design

165. Kurlyandchik I, Tiralongo E, Schloss J. Safety and Efficacy of Medicinal Cannabis in the Treatment of Fibromyalgia: A Systematic Review. Journal of Alternative & Complementary Medicine. 2021 Mar;27(3):198-213. doi: https://dx.doi.org/10.1089/acm.2020.0331. PMID: 33337931. **Exclusion:** Systematic review used as source document

166. Kurt V, Aras O, Buker N. Comparison of conservative treatment with and without neural mobilization for patients with low back pain: A prospective, randomized clinical trial. Journal of Back & Musculoskeletal Rehabilitation. 2020;33(6):969-75. doi: https://dx.doi.org/10.3233/BMR-181241. PMID: 32144973. **Exclusion**: Inadequate duration of followup

167. Kwon SH, Chung EJ, Lee J, et al. The Effect of Hamstring Relaxation Program on Headache, Pressure Pain Threshold, and Range of Motion in Patients with Tension Headache: A Randomized Controlled Trial.

International Journal of Environmental Research & Public Health [Electronic Resource]. 2021 09 27;18(19):27. doi: https://dx.doi.org/10.3390/ijerph181910137. PMID: 34639438. **Exclusion:** Inadequate duration of followup

168. Lascurain-Aguirrebena I, Newham DJ, Casado-Zumeta X, et al. Immediate effects of cervical mobilisations on neck muscle activity during active neck movements in patients with non-specific neck pain. A double blind placebo controlled trial. Physiotherapy. 2021 03;110:42-53. doi: https://dx.doi.org/10.1016/j.physio.2019.07.003. PMID: 33131786. **Exclusion:** Inadequate duration of followup

169.* Lee AC, Price LL, Bannuru R, et al. Mindfulness as a mediator of pain reduction after tai chi exercise intervention among adults with fibromyalgia. PM and r. 2021;13:S21-S2. PMID: CN-02356871 NEW. **Exclusion:** Ineligible study design

170. Lee E, Lee S. Impact of Cervical Sensory Feedback for Forward Head Posture on Headache Severity and Physiological Factors in Patients with Tension-type Headache: A Randomized, Single-Blind, Controlled Trial. Medical Science Monitor. 2019 Dec 15;25:9572-84. doi: https://dx.doi.org/10.12659/MSM.918595. PMID: 31838486. **Exclusion:** Inadequate duration of followup

171.* Lee J, Cho JH, Kim KW, et al. Chuna Manual Therapy vs Usual Care for Patients With Nonspecific Chronic Neck Pain: A Randomized Clinical Trial. JAMA Network Open. 2021 07 01;4(7):e2113757. doi: https://dx.doi.org/10.1001/jamanetworkopen.2021.13757. PMID: 34259850. **Exclusion:** Ineligible population

172. Lee K, Lewis GN. Short term relief of multisite chronicpain with Bowen Therapy: A double-blind, randomized controlled trial. Journal of Bodywork & Movement Therapies. 2020 Oct;24(4):271-9. doi: https://dx.doi.org/10.1016/j.jbmt.2020.06.025. PMID: 33218522. **Exclusion:** Ineligible study design

173. Lena O, Todri J, Todri A, et al. The Effectiveness of the Mezieres Method in Elite Rhythmic Gymnastics Athletes With Low Back Pain: A Randomized Controlled Trial. Journal of Sport Rehabilitation. 2020 Sep 01;29(7):913-9. doi: https://dx.doi.org/10.1123/jsr.2019-0204. PMID: 31711041. **Exclusion:** Ineligible population

174. Letafatkar A, Rabiei P, Alamooti G, et al. Effect of therapeutic exercise routine on pain, disability, posture, and health status in dentists with chronic neck pain: a randomized controlled trial. International Archives of Occupational & Environmental Health. 2020 04;93(3):281-90. doi: https://dx.doi.org/10.1007/s00420-019-01480-x. PMID: 31654125. **Exclusion:** Inadequate duration of followup

175. Li C, Pei Q, Chen Y, et al. The response-time relationship and covariate effects of acupuncture for chronic pain: A systematic review and model-based longitudinal meta-analysis. European Journal of Pain. 2020 10;24(9):1653-65. doi: https://dx.doi.org/10.1002/ejp.1617. PMID: 32533885. **Exclusion:** Systematic review used as source document

176. Li R, Chen H, Feng J, et al. Effectiveness of Traditional Chinese Exercise for Symptoms of Knee Osteoarthritis: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. International Journal of Environmental Research & Public Health [Electronic Resource]. 2020 10 27;17(21):27. doi: https://dx.doi.org/10.3390/ijerph17217873. PMID: 33121082. **Exclusion:** Systematic review used as source document

177. Li YX, Yuan SE, Jiang JQ, et al. Systematic review and meta-analysis of effects of acupuncture on pain and function in non-specific low back pain. Acupuncture in Medicine. 2020 08;38(4):235-43. doi: https://dx.doi.org/10.1136/acupmed-2017-011622. PMID: 32458717. **Exclusion:** Systematic review used as source document

178. Liao FY, Lin CL, Lo SF, et al. Efficacy of Acupoints Dual-Frequency Low-Level Laser Therapy on Knee Osteoarthritis. Evidence-Based Complementary & Alternative Medicine: eCAM. 2020;2020:6979105. doi: https://dx.doi.org/10.1155/2020/6979105. PMID: 33029170. **Exclusion:** Inadequate duration of followup

179.* Liao X, Chen H, Ge B. The effect of mind-body exercise on cervical spine mobility of

people with neck discomfort: A systemic review and meta-analysis of randomised controlled trials. PLoS ONE [Electronic Resource]. 2022;17(1):e0262429. doi: https://dx.doi.org/10.1371/journal.pone.0262429. PMID: 35061772. **Exclusion:** Systematic review, not directly used

180. Lilje S, Eklund A, Wykman A, et al. Naprapathy versus orthopaedic standard care for common musculoskeletal disorders: an 8-year follow-up of a pragmatic randomized controlled trial in Sweden. Chiropractic & manual therapies. 2021 11 02;29(1):43. doi: https://dx.doi.org/10.1186/s12998-021-00400-6. PMID: 34727936. **Exclusion:** Ineligible population

181. Lin KY, Tsai YJ, Hsu PY, et al. Effects of Sling Exercise for Neck Pain: A Systematic Review and Meta-Analysis. Physical Therapy. 2021 Apr 30;30:30. doi: https://dx.doi.org/10.1093/ptj/pzab120. PMID: 33929540. **Exclusion:** Systematic review used as source document

182.* Lin X, Li F, Lu H, et al. Acupuncturing of myofascial pain trigger points for the treatment of knee osteoarthritis: A systematic review and meta-analysis. Medicine. 2022 Feb 25;101(8):e28838. doi: https://dx.doi.org/10.1097/MD.0000000000028838. PMID: 35212282. **Exclusion:** Systematic review, not directly used

183. Lin YP, Su YH, Chin SF, et al. Light-emitting diode photobiomodulation therapy for non-specific low back pain in working nurses: A single-center, double-blind, prospective, randomized controlled trial. Medicine. 2020 Aug 07;99(32):e21611. doi: https://dx.doi.org/10.1097/MD.0000000000021611. PMID: 32769919. **Exclusion:** Ineligible intervention

184. Liu J, Yeung A, Xiao T, et al. Chen-Style Tai Chi for Individuals (Aged 50 Years Old or Above) with Chronic Non-Specific Low Back Pain: a Randomized Controlled Trial. International journal of environmental research and public health. 2019;16(3) PMID: CN-01707017. **Exclusion:** Inadequate duration of followup

185. Liu M, Tong Y, Chai L, et al. Effects of Auricular Point Acupressure on Pain Relief: A Systematic Review. Pain Management Nursing. 2021 Jun;22(3):268-80. doi: https://dx.doi.org/10.1016/j.pmn.2020.07.007. PMID: 32950391. **Exclusion:** Systematic review used as source document

186. Lopez-de-Uralde-Villanueva I, Beltran-Alacreu H, Fernandez-Carnero J, et al. Pain management using a multimodal physiotherapy program including a biobehavioral approach for chronic nonspecific neck pain: a randomized controlled trial. Physiotherapy Theory & Practice. 2020 Jan;36(1):45-62. doi: https://dx.doi.org/10.1080/09593985.2018.1480678. PMID: 29889599. **Exclusion:** Ineligible intervention

187. Low MY, Lacson C, Zhang F, et al. Vocal Music Therapy for Chronic Pain: A Mixed Methods Feasibility Study. Journal of Alternative & Complementary Medicine. 2020 Feb;26(2):113-22. doi: https://dx.doi.org/10.1089/acm.2019.0249. PMID: 31750726. **Exclusion:** Ineligible population

188. Luan L, Bousie J, Pranata A, et al. Stationary cycling exercise for knee osteoarthritis: A systematic review and meta-analysis. Clinical Rehabilitation. 2021 Apr;35(4):522-33. doi: https://dx.doi.org/10.1177/0269215520971795. PMID: 33167714. **Exclusion:** Systematic review used as source document

189. Ludvigsson ML, Peterson G, Peolsson A. Neck-specific exercise for radiating pain and neurological deficits in chronic whiplash, a 1-year follow-up of a randomised clinical trial. Scientific Reports. 2020 04 21;10(1):6758. doi: https://dx.doi.org/10.1038/s41598-020-62722-4. PMID: 32317700. **Exclusion:** Ineligible intervention

190. Lv ZT, Shen LL, Zhu B, et al. Effects of intensity of electroacupuncture on chronic pain in patients with knee osteoarthritis: a randomized controlled trial. Arthritis research & therapy. 2019;21(1):120. PMID: CN-01940220.Exclusion: Inadequate duration of followup

191.* Lwin NN, Myint T, Oo WM, et al. EFFICACY on PRESSURE-BIOFEEDBACK GUIDED CRANIOCERVICAL FLEXION EXERCISE in NECK PAIN A RANDOMIZED CONTROLLED TRIAL. Journal of musculoskeletal research. 2021

PMID: CN-02295257 NEW. **Exclusion:** Ineligible population

192. Machado-Oliveira L, da Silva Gauto YO, de Santana Neto FJ, et al. Effects of Different Exercise Intensities on Headache: A Systematic Review. American Journal of Physical Medicine & Rehabilitation. 2020 05;99(5):390-6. doi: https://dx.doi.org/10.1097/PHM.0000000000001349. PMID: 31725018. **Exclusion:** Systematic review used as source document

193. Madadi-Shad M, Jafarnezhadgero AA, Sheikhalizade H, et al. Effect of a corrective exercise program on gait kinetics and muscle activities in older adults with both low back pain and pronated feet: A double-blind, randomized controlled trial. Gait & Posture. 2020 02;76:339-45. doi: https://dx.doi.org/10.1016/j.gaitpost.2019.12.026. PMID: 31896537. **Exclusion:** Inadequate duration of followup

194.* Magni N, McNair P, Rice D. Six weeks of resistance training (plus advice) vs advice only in hand osteoarthritis: a single-blind, randomised, controlled feasibility trial. Musculoskeletal science and practice. 2022;57 PMID: CN-02347767 NEW. **Exclusion:** Inadequate duration of follow-up

195.* Maheu E, Soriot-Thomas S, Noel E, et al. Wearable transcutaneous electrical nerve stimulation device (actiTENS) is more efficient and better tolerated than weak opioids in knee osteoarthritis pain. International journal of rheumatic diseases. 2021;24(SUPPL 2):190-1. PMID: CN-02337729 NEW. **Exclusion:** Ineligible study design

196.* Maheu E, Soriot-Thomas S, Noel E, et al. Is wearable transcutaneous electrical nerve stimulation (Actitens(R)) a relevant alternative to weak opioids for knee osteoarthritis chronic, nociceptive pain. Results of a randomized, controlled, non-inferiority trial. Osteoarthritis and cartilage. 2021;29:S420-S1. PMID: CN-02274601 NEW. **Exclusion:** Ineligible study design

197.* Maheu E, Soriot-Thomas S, Noel E, et al. Wearable transcutaneous electrical nerve stimulation (actiTENS(R)) is effective and safe for the treatment of knee osteoarthritis pain: a randomized controlled trial versus weak opioids. Ther Adv Musculoskelet Dis. 2022;14:1759720X211066233. doi: 10.1177/1759720X211066233. PMID: 35069809. **Exclusion:** Inadequate duration of follow-up

198.* Maheu E, Soriot-Thomas S, Noel E, et al. Wearable transcutaneous electrical nerve stimulation demonstrated better efficacy and safety than weak opioids in the treatment of moderate to severe, chronic nociceptive pain in knee osteoarthritis. A randomized, controlled, non-inferiority trial. Annals of the rheumatic diseases. 2021;80(SUPPL 1):364-5. PMID: CN-02303750 NEW. **Exclusion:** Ineligible study design

199. Mahler EAM, Minten MJ, Leseman-Hoogenboom MM, et al. Effectiveness of low-dose radiation therapy on symptoms in patients with knee osteoarthritis: a randomised, double-blinded, sham-controlled trial. Annals of the rheumatic diseases. 2019;78(1):83-90. PMID: CN-02000205. **Exclusion:** Ineligible intervention

200.* Mahmood T, Afzal W, Ahmad U, et al. Comparative effectiveness of routine physical therapy with and without instrument assisted soft tissue mobilization in patients with neck pain due to upper crossed syndrome. JPMA - Journal of the Pakistan Medical Association. 2021 Oct;71(10):2304-8. doi: https://dx.doi.org/10.47391/JPMA.03-415. PMID: 34974559. **Exclusion:** Ineligible intervention

201.* Makris U, Yang A, Spence N, et al. Improving outcomes in older veterans with chronic low back pain and comorbid depression: preliminary data from the motivate pilot trial. Journal of the American Geriatrics Society. 2021;69(SUPPL 1):S131-S2. PMID: CN-02263836 NEW. **Exclusion:** Ineligible study design

202. Marconcin P, Yazigi F, Teles J, et al. The effectiveness of a randomised clinical trial of PLE2 NO self-management and exercise programme for knee osteoarthritis to improve self-efficacy. Musculoskeletal Care. 2021 Jun 02;02:02. doi: https://dx.doi.org/10.1002/msc.1573. PMID: 34077602. **Exclusion:** Inadequate duration of followup

203.* Marin-Mendez H, Marin-Novoa P, Jimenez-Marin S, et al. Using a Robot to Treat Non-specific Low Back Pain: results From a

Two-Arm, Single-Blinded, Randomized Controlled Trial. Frontiers in neurorobotics. 2021;15 PMID: CN-02337392 NEW. **Exclusion:** Inadequate duration of follow-up

204. Martimbianco ALC, Porfirio GJ, Pacheco RL, et al. Transcutaneous electrical nerve stimulation (TENS) for chronic neck pain. Cochrane Database of Systematic Reviews. 2019 12 12;12:CD011927. doi: https://dx.doi.org/10.1002/14651858.CD011927.pub2. PMID: 31830313.**Exclusion:** Systematic review used as source document

205. Martinez-Calderon J, Flores-Cortes M, Morales-Asencio JM, et al. Intervention Therapies to Reduce Pain-Related Fear in Fibromyalgia Syndrome: A Systematic Review of Randomized Clinical Trials. Pain Medicine. 2021 02 23;22(2):481-98. doi: https://dx.doi.org/10.1093/pm/pnaa331. PMID: 32989450. **Exclusion:** Systematic review used as source document

206. Mascarenhas RO, Souza MB, Oliveira MX, et al. Association of Therapies With Reduced Pain and Improved Quality of Life in Patients With Fibromyalgia: A Systematic Review and Meta-analysis. JAMA Internal Medicine. 2021 Jan 01;181(1):104-12. doi: https://dx.doi.org/10.1001/jamainternmed.2020.5651. PMID: 33104162. **Exclusion:** Systematic review used as source document

207.* Mascarenhas RO, Souza MB, Oliveira MX, et al. Association of Therapies With Reduced Pain and Improved Quality of Life in Patients With Fibromyalgia: A Systematic Review and Meta-analysis. JAMA Internal Medicine. 2021 01 01;181(1):104-12. doi: https://dx.doi.org/10.1001/jamainternmed.2020.5651. PMID: 33104162. **Exclusion:** Systematic review, not directly used

208.* Mazreati N, Rahemi Z, Aghajani M, et al. Effect of craniosacral therapy on the intensity of chronic back pain of nurses: a randomized controlled trial. Nursing practice today. 2021;8(4):313-21. PMID: CN-02309161 NEW. **Exclusion:** Ineligible intervention

209. McCurry SM, Zhu W, Von Korff M, et al. Effect of Telephone Cognitive Behavioral Therapy for Insomnia in Older Adults With Osteoarthritis Pain: A Randomized Clinical Trial. JAMA Internal Medicine. 2021 Apr 01;181(4):530-8. doi: https://dx.doi.org/10.1001/jamainternmed.2020.9049. PMID: 33616613.**Exclusion:** Ineligible intervention

210.* McVeigh KH, Kannas SN, Ivy CC, et al. Dynamic stabilization home exercise program for treatment of thumb carpometacarpal osteoarthritis: a prospective randomized control trial. Journal of hand therapy. 2021 PMID: CN-02304983 NEW. **Exclusion:** Ineligible comparator

211. Mehri A, Letafatkar A, Khosrokiani Z. Effects of Corrective Exercises on Posture, Pain, and Muscle Activation of Patients With Chronic Neck Pain Exposed to Anterior-Posterior Perturbation. Journal of Manipulative & Physiological Therapeutics. 2020 05;43(4):311-24. doi: https://dx.doi.org/10.1016/j.jmpt.2018.11.032. PMID: 32723668. **Exclusion:** Inadequate duration of followup

212. Mohamadi M, Rojhani-Shirazi Z, Assadsangabi R, et al. Can the Positional Release Technique Affect Central Sensitization in Patients With Chronic Tension-Type Headache? A Randomized Clinical Trial. Archives of Physical Medicine & Rehabilitation. 2020 10;101(10):1696-703. doi: https://dx.doi.org/10.1016/j.apmr.2020.05.028. PMID: 32673652. **Exclusion:** Inadequate duration of followup

213. Moller F, Ortiz-Munoz L, Irarrazaval S. Offloader knee braces for knee osteoarthritis. Medwave. 2021 Apr 28;21(3):e8115. doi: https://dx.doi.org/10.5867/medwave.2021.03.8114. PMID: 34038401.**Exclusion:** Systematic Review used as source document

214.* Moreira V, da Silva Soares F, Hattori WT, et al. A comparison of the efficacy of nonweight-bearing and weight-bearing exercise programmes on function and pain pressure thresholds in knee osteoarthritis: a randomised study. European journal of physiotherapy. 2021;23(3):171-8. PMID: CN-02308753 NEW. **Exclusion:** Ineligible comparator

215. Moseng T, Dagfinrud H, van Bodegom-Vos L, et al. Low adherence to exercise may have influenced the proportion of OMERACT-OARSI responders in an integrated osteoarthritis care model: secondary analyses from a cluster-randomised stepped-wedge trial. BMC

Musculoskeletal Disorders. 2020 Apr 13;21(1):236. doi: https://dx.doi.org/10.1186/s12891-020-03235-z. PMID: 32284049. **Exclusion:** Ineligible intervention

216. Movahedi Najafabadi M, Ghafari S, Nazari F, et al. The effect of acupressure on quality of life among female nurses with chronic back pain. Applied Nursing Research. 2020 02;51:151175. doi: https://dx.doi.org/10.1016/j.apnr.2019.05.020. PMID: 31831270. **Exclusion:** Ineligible study design

217. Mu J, Furlan AD, Lam WY, et al. Acupuncture for chronic nonspecific low back pain. Cochrane Database of Systematic Reviews. 2020 12 11;12:CD013814. doi: https://dx.doi.org/10.1002/14651858.CD013814. PMID: 33306198. **Exclusion:** Systematic review used as source document

218. Mukhtar NB, Meeus M, Gursen C, et al. Effectiveness of Hands-Off Therapy in the Management of Primary Headache: A Systematic Review and Meta-Analysis. Evaluation & the Health Professions. 2021 Jan 07:163278720983408. doi: https://dx.doi.org/10.1177/0163278720983408. PMID: 33406891. **Exclusion:** Systematic review used as source document

219. Munukka M, Waller B, Hakkinen A, et al. Effects of progressive aquatic resistance training on symptoms and quality of life in women with knee osteoarthritis: A secondary analysis. Scandinavian Journal of Medicine & Science in Sports. 2020 Jun;30(6):1064-72. doi: https://dx.doi.org/10.1111/sms.13630. PMID: 31999876. **Exclusion:** Inadequate duration of followup

220. Murphy SL, Harris RE, Keshavarzi NR, et al. Self-Administered Acupressure for Chronic Low Back Pain: A Randomized Controlled Pilot Trial. Pain Medicine. 2019 12 01;20(12):2588-97. doi: https://dx.doi.org/10.1093/pm/pnz138. PMID: 31237610. **Exclusion:** Inadequate duration of followup

221. Nadal-Nicolas Y, Rubio-Arias JA, Martinez-Olcina M, et al. Effects of Manual Therapy on Fatigue, Pain, and Psychological Aspects in Women with Fibromyalgia. International Journal of Environmental Research & Public Health [Electronic Resource]. 2020 06 26;17(12):26. doi: https://dx.doi.org/10.3390/ijerph17124611. PMID: 32604939. **Exclusion:** Ineligible study design

222. Nakamaru K, Aizawa J, Kawarada K, et al. Immediate effects of thoracic spine self-mobilization in patients with mechanical neck pain: a randomized controlled trial. Journal of bodywork and movement therapies. 2019;23(2):417-24. PMID: CN-02083937 NEW. **Exclusion:** Inadequate duration of followup

223. Nambi G, Abdelbasset WK, Alqahtani BA, et al. Isokinetic back training is more effective than core stabilization training on pain intensity and sports performances in football players with chronic low back pain: A randomized controlled trial. Medicine. 2020 May 22;99(21):e20418. doi: https://dx.doi.org/10.1097/MD.0000000000020418. PMID: 32481345. **Exclusion:** Ineligible comparator

224. Nambi G, Abdelbasset WK, Alrawaili SM, et al. Virtual reality or isokinetic training; its effect on pain, kinesiophobia and serum stress hormones in chronic low back pain: A randomized controlled trial. Technology & Health Care. 2021;29(1):155-66. doi: https://dx.doi.org/10.3233/THC-202301. PMID: 32831210. **Exclusion:** Ineligible comparator

225. Nambi G, Abdelbasset WK, Alsubaie SF, et al. Short-Term Psychological and Hormonal Effects of Virtual Reality Training on Chronic Low Back Pain in Soccer Players. Journal of Sport Rehabilitation. 2021 Feb 16:1-10. doi: https://dx.doi.org/10.1123/jsr.2020-0075. PMID: 33596538. **Exclusion:** Ineligible comparator

226. Namnaqani FI, Mashabi AS, Yaseen KM, et al. The effectiveness of McKenzie method compared to manual therapy for treating chronic low back pain: a systematic review. Journal of Musculoskeletal Neuronal Interactions. 2019 12 01;19(4):492-9. PMID: 31789300. **Exclusion:** Systematic review used as source document

227. Nduwimana I, Nindorera F, Thonnard JL, et al. Effectiveness of walking versus mind-body therapies in chronic low back pain: A systematic review and meta-analysis of recent randomized controlled trials.

Medicine. 2020 Aug 28;99(35):e21969. doi: https://dx.doi.org/10.1097/MD.0000000000021969. PMID: 32871946. **Exclusion:** Systematic review used as source document

228.* Nejati P, Mousavi R, Angoorani H. Acupuncture is as effective as exercise for improvement of chronic neck pain: a randomized clinical trial. Shiraz e medical journal. 2021;22(3):1-7. PMID: CN-02264213 NEW. **Exclusion:** Ineligible population

229. Nelligan RK, Hinman RS, Kasza J, et al. Effects of a Self-directed Web-Based Strengthening Exercise and Physical Activity Program Supported by Automated Text Messages for People With Knee Osteoarthritis: A Randomized Clinical Trial. JAMA Internal Medicine. 2021 Jun 01;181(6):776-85. doi: https://dx.doi.org/10.1001/jamainternmed.2021.0991. PMID: 33843948. **Exclusion:** Ineligible intervention

230. Nelligan RK, Hinman RS, McManus F, et al. Moderators of the Effect of a Self-directed Digitally Delivered Exercise Program for People With Knee Osteoarthritis: Exploratory Analysis of a Randomized Controlled Trial. Journal of Medical Internet Research. 2021 10 29;23(10):e30768. doi: https://dx.doi.org/10.2196/30768. PMID: 34714252. **Exclusion:** Ineligible intervention

231. Nery M, Natour J, Jennings F, et al. Effects of a progressive resistance exercise program in patients with hand osteoarthritis: A randomized, controlled trial with a blinded assessor. Clinical Rehabilitation. 2021 Jul 09:2692155211030622. doi: https://dx.doi.org/10.1177/02692155211030622. PMID: 34240642. **Exclusion:** Inadequate duration of followup

232. Niederer D, Engel T, Vogt L, et al. Motor Control Stabilisation Exercise for Patients with Non-Specific Low Back Pain: A Prospective Meta-Analysis with Multilevel Meta-Regressions on Intervention Effects. Journal of Clinical Medicine. 2020 Sep 22;9(9):22. doi: https://dx.doi.org/10.3390/jcm9093058. PMID: 32971921. **Exclusion:** Systematic review used as source document

233. Noori SA, Rasheed A, Aiyer R, et al. Therapeutic Ultrasound for Pain Management in Chronic Low Back Pain and Chronic Neck Pain: A Systematic Review. Pain Medicine. 2020 11 07;21(7):1482-93. doi: https://dx.doi.org/10.1093/pm/pny287. PMID: 30649460. **Exclusion:** Systematic review used as source document

234. Norouzi E, Hosseini F, Vaezmosavi M, et al. Zumba dancing and aerobic exercise can improve working memory, motor function, and depressive symptoms in female patients with Fibromyalgia. European Journal of Sport Science EJSS : Official Journal of the European College of Sport Science. 2020 Aug;20(7):981-91. doi: https://dx.doi.org/10.1080/17461391.2019.1683610. PMID: 31630663. **Exclusion:** Inadequate duration of followup

235. Novak S, Guerron G, Zou Z, et al. New Guidelines for Electrical Stimulation Parameters in Adult Patients With Knee Osteoarthritis Based on a Systematic Review of the Current Literature. American Journal of Physical Medicine & Rehabilitation. 2020 08;99(8):682-8. doi: https://dx.doi.org/10.1097/PHM.0000000000001409. PMID: 32167955. **Exclusion:** Systematic review used as source document

236. O'Keeffe M, O'Sullivan P, Purtill H, et al. Cognitive functional therapy compared with a group-based exercise and education intervention for chronic low back pain: a multicentre randomised controlled trial (RCT). British Journal of Sports Medicine. 2020 Jul;54(13):782-9. doi: https://dx.doi.org/10.1136/bjsports-2019-100780. PMID: 31630089. **Exclusion:** Ineligible intervention

237. Oh SL, Kim DY, Bae JH, et al. Effects of rural community-based integrated exercise and health education programs on the mobility function of older adults with knee osteoarthritis. Aging Clinical & Experimental Research. 2020 Feb 04;04:04. doi: https://dx.doi.org/10.1007/s40520-020-01474-7. PMID: 32020485. **Exclusion:** Inadequate duration of followup

238.* Olsen AL, Magnussen LH, Skjaerven LH, et al. Basic Body Awareness Therapy versus standard care in hip osteoarthritis. A randomized controlled trial. Physiotherapy Research International. 2022

Jan;27(1):e1930. doi: https://dx.doi.org/10.1002/pri.1930. PMID: 34811841. **Exclusion:** Inadequate duration of follow-up

239.* Osteras N, Moseng T, Van Bodegom-Vos L, et al. Higher quality of care and less surgery after implementing osteoarthritis guidelines in primary care: long-term results from a cluster randomized controlled trial. Scandinavian journal of rheumatology. 2021;50(SUPPL 130):5-6. PMID: CN-02326847 NEW. **Exclusion:** Ineligible study design

240. Ots T, Kandirian A, Szilagyi I, et al. The selection of dermatomes for sham (placebo) acupuncture points is relevant for the outcome of acupuncture studies: a systematic review of sham (placebo)-controlled randomized acupuncture trials. Acupuncture in Medicine. 2020 08;38(4):211-26. doi: https://dx.doi.org/10.1177/0964528419889636. PMID: 32026725. **Exclusion:** Systematic review used as source document

241. Ouellet P, Lafrance S, Pizzi A, et al. Region-specific exercises versus general exercises approaches in the management of spinal and peripheral musculoskeletal disorders: a systematic review with meta-analyses of randomized controlled trials. Archives of Physical Medicine & Rehabilitation. 2021 Mar 05;05:05. doi: https://dx.doi.org/10.1016/j.apmr.2021.01.093. PMID: 33684362. **Exclusion:** Systematic review used as source document

242.* Pach D, Blodt S, Wang J, et al. App-Based Relaxation Exercises for Patients With Chronic Neck Pain: Pragmatic Randomized Trial. JMIR MHealth and UHealth. 2022 01 07;10(1):e31482. doi: https://dx.doi.org/10.2196/31482. PMID: 34994708. **Exclusion:** Ineligible intervention

243. Paganini S, Lin J, Kahlke F, et al. A guided and unguided internet- and mobile-based intervention for chronic pain: health economic evaluation alongside a randomised controlled trial. BMJ open. 2019;9(4):e023390. PMID: CN-01941119. **Exclusion:** Ineligible population

244. Papaconstantinou E, Cancelliere C, Verville L, et al. Effectiveness of non-pharmacological interventions on sleep characteristics among adults with musculoskeletal pain and a comorbid sleep problem: a systematic review. Chiropractic & manual therapies. 2021 Jul 08;29(1):23. doi: https://dx.doi.org/10.1186/s12998-021-00381-6. PMID: 34238325. **Exclusion:** Systematic review used as source document

245. Pardos-Gascon EM, Narambuena L, Leal-Costa C, et al. Differential efficacy between cognitive-behavioral therapy and mindfulness-based therapies for chronic pain: Systematic review. International Journal of Clinical & Health Psychology. 2021 Jan-Apr;21(1):100197. doi: https://dx.doi.org/10.1016/j.ijchp.2020.08.001. PMID: 33363580. **Exclusion:** Systematic review used as source document

246.* Park HK, Song MK, Kim DJ, et al. Comparison of core muscle strengthening exercise and stretching exercise in middle-aged women with fibromyalgia: A randomized, single-blind, controlled study. Medicine. 2021 Dec 17;100(50):e27854. doi: https://dx.doi.org/10.1097/MD.0000000000027854. PMID: 34918634. **Exclusion:** Ineligible comparator

247.* Park KS, Kim S, Kim C, et al. A comparative study of the effectiveness of pharmacopuncture therapy for chronic neck pain: a pragmatic, randomized, controlled trial. Journal of clinical medicine. 2022;11(1) PMID: CN-02358032 NEW. **Exclusion:** Ineligible intervention

248.* Park S, Min S, Park SH, et al. Influence of Isometric Exercise Combined With Electromyostimulation on Inflammatory Cytokine Levels, Muscle Strength, and Knee Joint Function in Elderly Women With Early Knee Osteoarthritis. Frontiers in physiology. 2021;12 PMID: CN-02303073 NEW. **Exclusion:** Inadequate duration of follow-up

249. Park S, Park S, Min S, et al. A Randomized Controlled Trial Investigating the Effects of Equine Simulator Riding on Low Back Pain, Morphological Changes, and Trunk Musculature in Elderly Women. Medicina. 2020 Nov 13;56(11):13. doi: https://dx.doi.org/10.3390/medicina56110610. PMID: 33202928. **Exclusion:** Inadequate duration of followup

250. Park SY, Hwang EH, Cho JH, et al. Comparative Effectiveness of Chuna Manipulative Therapy for Non-Acute Lower Back Pain: A Multi-Center, Pragmatic, Randomized Controlled Trial. Journal of Clinical Medicine. 2020 Jan 05;9(1):05. doi: https://dx.doi.org/10.3390/jcm9010144. PMID: 31948083. **Exclusion:** Ineligible population

251. Patel K, Sutherland H, Henshaw J, et al. Effects of neurofeedback in the management of chronic pain: A systematic review and meta-analysis of clinical trials. European Journal of Pain. 2020 09;24(8):1440-57. doi: https://dx.doi.org/10.1002/ejp.1612. PMID: 32502283. **Exclusion:** Systematic review used as source document

252. Paulo LR, Lacerda ACR, Martins FLM, et al. Can a Single Trial of a Thoracolumbar Myofascial Release Technique Reduce Pain and Disability in Chronic Low Back Pain? A Randomized Balanced Crossover Study. Journal of Clinical Medicine. 2021 May 07;10(9):07. doi: https://dx.doi.org/10.3390/jcm10092006. PMID: 34067152. **Exclusion:** Inadequate duration of followup

253. Pedersini P, Valdes K, Cantero-Tellez R, et al. Effects of Neurodynamic Mobilizations on Pain Hypersensitivity in Patients With Hand Osteoarthritis Compared to Robotic Assisted Mobilization: A Randomized Controlled Trial. Arthritis care & research. 2021 02;73(2):232-9. doi: https://dx.doi.org/10.1002/acr.24103. PMID: 31675184. **Exclusion:** Ineligible comparator

254. Pei JH, Ma T, Nan RL, et al. Mindfulness-Based Cognitive Therapy for Treating Chronic Pain A Systematic Review and Meta-analysis. Psychology Health & Medicine. 2021 03;26(3):333-46. doi: https://dx.doi.org/10.1080/13548506.2020.1849746. PMID: 33241941. **Exclusion:** Systematic review used as source document

255.* Pekyavas NO, Saygili F, Yuruk ZO, et al. The effects of exercise and lifestyle modification on pain and function in mobile phone users: a randomized controlled study. Acta medica mediterranea. 2021;37(3):1803-9. PMID: CN-02287865 NEW. **Exclusion: Ineligible population**

256. Perlini C, Donisi V, Del Piccolo L. From research to clinical practice: a systematic review of the implementation of psychological interventions for chronic headache in adults. BMC Health Services Research. 2020 May 25;20(1):459. doi: https://dx.doi.org/10.1186/s12913-020-05172-y. PMID: 32450871. **Exclusion:** Systematic review used as source document

257. Perlman A, Fogerite SG, Glass O, et al. Efficacy and Safety of Massage for Osteoarthritis of the Knee: a Randomized Clinical Trial. Journal of general internal medicine. 2019;34(3):379-86. PMID: CN-02145187. **Exclusion:** Ineligible study design

258. Petrozzi MJ, Leaver A, Ferreira PH, et al. Addition of MoodGYM to physical treatments for chronic low back pain: A randomized controlled trial. Chiropractic & manual therapies. 2019;27:54. doi: https://dx.doi.org/10.1186/s12998-019-0277-4. PMID: 31673330. **Exclusion:** Ineligible intervention

259. Petterson S, Plancher K, Klyve D, et al. Low-Intensity Continuous Ultrasound for the Symptomatic Treatment of Upper Shoulder and Neck Pain: A Randomized, Double-Blind Placebo-Controlled Clinical Trial. Journal of pain research. 2020;13:1277-87. doi: https://dx.doi.org/10.2147/JPR.S247463. PMID: 32606899. **Exclusion:** Ineligible study design

260. Phattharasupharerk S, Purepong N, Eksakulkla S, et al. Effects of Qigong practice in office workers with chronic non-specific low back pain: a randomized control trial. Journal of bodywork and movement therapies. 2019;23(2):375-81. PMID: CN-02083942 NEW. **Exclusion:** Inadequate duration of followup

261. Pico-Espinosa OJ, Aboagye E, Cote P, et al. Deep tissue massage, strengthening and stretching exercises, and a combination of both compared with advice to stay active for subacute or persistent non-specific neck pain: A cost-effectiveness analysis of the Stockholm Neck trial (STONE). Musculoskeletal Science & Practice. 2020 04;46:102109. doi: https://dx.doi.org/10.1016/j.msksp.2020.102109. PMID: 31989965. **Exclusion:** Ineligible outcomes

262. Pietrosimone B, Luc-Harkey BA, Harkey MS, et al. Using TENS to Enhance Therapeutic Exercise in Individuals with Knee Osteoarthritis. Medicine & Science in Sports & Exercise. 2020 10;52(10):2086-95. doi: https://dx.doi.org/10.1249/MSS.0000000000002353. PMID: 32251254. **Exclusion:** Ineligible comparator

263. Pitsillides A, Stasinopoulos D, Giannakou K. The effects of cognitive behavioural therapy delivered by physical therapists in knee osteoarthritis pain: A systematic review and meta-analysis of randomized controlled trials. Journal of Bodywork & Movement Therapies. 2021 Jan;25:157-64. doi: https://dx.doi.org/10.1016/j.jbmt.2020.11.002. PMID: 33714488. **Exclusion:** Systematic review used as source document

264. Polaski AM, Phelps AL, Smith TJ, et al. Integrated Meditation and Exercise Therapy: A Randomized Controlled Pilot of a Combined Nonpharmacological Intervention Focused on Reducing Disability and Pain in Patients with Chronic Low Back Pain. Pain Medicine. 2021 02 23;22(2):444-58. doi: https://dx.doi.org/10.1093/pm/pnaa403. PMID: 33621332. **Exclusion:** Inadequate duration of followup

265. Prado ERA, Meireles SM, Carvalho ACA, et al. Influence of isostretching on patients with chronic low back pain. A randomized controlled trial. Physiotherapy Theory & Practice. 2021 Feb;37(2):287-94. doi: https://dx.doi.org/10.1080/09593985.2019.1625091. PMID: 31161855. **Exclusion:** Inadequate duration of followup

266. Pujol J, Ramos-Lopez D, Blanco-Hinojo L, et al. Testing the effects of gentle vibrotactile stimulation on symptom relief in fibromyalgia. Arthritis Research & Therapy. 2019 06 14;21(1):148. doi: https://dx.doi.org/10.1186/s13075-019-1932-9. PMID: 31200775. **Exclusion:** Inadequate duration of followup

267. Qing W, Shi X, Zhang Q, et al. Effect of Therapeutic Ultrasound for Neck Pain: A Systematic Review and Meta-Analysis. Archives of Physical Medicine & Rehabilitation. 2021 Mar 17;17:17. doi: https://dx.doi.org/10.1016/j.apmr.2021.02.009. PMID: 33722564. **Exclusion:** Systematic review used as source document

268. Racine M, Jensen MP, Harth M, et al. Operant Learning Versus Energy Conservation Activity Pacing Treatments in a Sample of Patients With Fibromyalgia Syndrome: a Pilot Randomized Controlled Trial. Journal of pain. 2019;20(4):420-39. PMID: CN-02145231 NEW. **Exclusion:** Ineligible comparator

269. Rae L, Dougherty P, Evertz N. Yoga vs Stretching in Veterans With Chronic Lower Back Pain and the Role of Mindfulness: A Pilot Randomized Controlled Trial. Journal of Chiropractic Medicine. 2020 Jun;19(2):101-10. doi: https://dx.doi.org/10.1016/j.jcm.2019.10.005. PMID: 33318728. **Exclusion:** Ineligible study design

270.* Rafiq MT, Abdul Hamid MS, Hafiz E. The effect of rehabilitation protocol using mobile health in overweight and obese patients with knee osteoarthritis: a clinical trial. Advances in Rheumatology. 2021 10 24;61(1):63. doi: https://dx.doi.org/10.1186/s42358-021-00221-4. PMID: 34689837. **Exclusion:** Inadequate duration of follow-up

271.* Rafiq MT, Hamid MSA, Hafiz E. Short-Term Effects of Strengthening Exercises of the Lower Limb Rehabilitation Protocol on Pain, Stiffness, Physical Function, and Body Mass Index among Knee Osteoarthritis Participants Who Were Overweight or Obese: A Clinical Trial. Thescientificworldjournal. 2021;2021:6672274. doi: https://dx.doi.org/10.1155/2021/6672274. PMID: 34975349. **Exclusion:** Inadequate duration of follow-up

272.* Rafiq MT, Hamid MSA, Hafiz E, et al. Feasibility and Acceptability of Instructions of Daily Care in Overweight and Obese Knee Osteoarthritis Participants. Current Rheumatology Reviews. 2021;17(4):421-7. doi: https://dx.doi.org/10.2174/1573397117666210727095552. PMID: 34315379. Exclusion: Inadequate duration of follow-up

273. Raghava Neelapala YV, Bhagat M, Shah P. Hip Muscle Strengthening for Knee Osteoarthritis: A Systematic Review of Literature. Journal of Geriatric Physical Therapy. 2020 Apr/Jun;43(2):89-98. doi:

https://dx.doi.org/10.1519/JPT.0000000000000214. PMID: 30407271. **Exclusion:** Systematic review used as source document

274. Rampazo EP, Martignago CCS, de Noronha M, et al. Transcutaneous electrical stimulation in neck pain: a systematic review and meta-analysis. European Journal of Pain. 2021 Jul 20;20:20. doi: https://dx.doi.org/10.1002/ejp.1845. PMID: 34288255. **Exclusion:** Systematic review used as source document

275.* Rampazo EP, Martignago CCS, de Noronha M, et al. Transcutaneous electrical stimulation in neck pain: A systematic review and meta-analysis. European Journal of Pain. 2022 01;26(1):18-42. doi: https://dx.doi.org/10.1002/ejp.1845. PMID: 34288255. **Exclusion:** Systematic review, not directly used

276. Raposo F, Ramos M, Lucia Cruz A. Effects of exercise on knee osteoarthritis: A systematic review. Musculoskeletal Care. 2021 Mar 05;05:05. doi: https://dx.doi.org/10.1002/msc.1538. PMID: 33666347. **Exclusion:** Systematic review used as source document

277. Razzaq A, Sajjad AG, Yasin S, et al. Comparison of Cyriax manipulation with traditional physical therapy for the management of cervical discogenic problems. A randomized control trial. JPMA - Journal of the Pakistan Medical Association. 2020 Aug;70(8):1329-33. doi: https://dx.doi.org/10.5455/JPMA.13250. PMID: 32794481. **Exclusion:** Inadequate duration of followup

278. Rickardsson J, Gentili C, Holmstrom L, et al. Internet-delivered acceptance and commitment therapy as microlearning for chronic pain: A randomized controlled trial with 1-year follow-up. European Journal of Pain. 2021 05;25(5):1012-30. doi: https://dx.doi.org/10.1002/ejp.1723. PMID: 33460240. **Exclusion:** Ineligible population

279.* Robbins SR, Alfredo PP, Junior WS, et al. Low-level laser therapy and static stretching exercises for patients with knee osteoarthritis: a randomised controlled trial. Clinical rehabilitation. 2692155211047017p. 2021 PMID: CN-02357331 NEW. **Exclusion:** Inadequate duration of follow-up

280.* Robbins SR, Alfredo PP, Junior WS, et al. Low-level laser therapy and static stretching exercises for patients with knee osteoarthritis: A randomised controlled trial. Clinical Rehabilitation. 2022 Feb;36(2):204-13. doi: https://dx.doi.org/10.1177/02692155211047017. PMID: 34714175. **Exclusion:** Inadequate duration of follow-up

281.* Rodriguez-Mansilla J, Mejias-Gil A, Garrido-Ardila EM, et al. Effects of non-pharmacological treatment on pain, flexibility, balance and quality of life in women with fibromyalgia: a randomised clinical trial. Journal of clinical medicine. 2021;10(17) PMID: CN-02301506 NEW. **Exclusion:** Inadequate duration of follow-up

282. Rodriguez-Roca B, Urcola-Pardo F, Anguas-Gracia A, et al. Impact of Reducing Sitting Time in Women with Fibromyalgia and Obesity: A Randomized Controlled Trial. International Journal of Environmental Research & Public Health [Electronic Resource]. 2021 Jun 09;18(12):09. doi: https://dx.doi.org/10.3390/ijerph18126237. PMID: 34207661. **Exclusion:** Ineligible intervention

283.* Roesel I, Steinhilber B, Martus P, et al. Secondary analysis of a study on exercise therapy in hip osteoarthritis: follow-up data on pain and physical functioning. International journal of environmental research and public health. 2021;18(16) PMID: CN-02302065 NEW. **Exclusion:** Inadequate duration of follow-up

284. Roseen EJ, Gerlovin H, Felson DT, et al. Which Chronic Low Back Pain Patients Respond Favorably to Yoga, Physical Therapy, and a Self-care Book? Responder Analyses from a Randomized Controlled Trial. Pain Medicine. 2021 02 04;22(1):165-80. doi: https://dx.doi.org/10.1093/pm/pnaa153. PMID: 32662833. **Exclusion:** Inadequate duration of followup

285. Rosenberg NR, Petersen SB, Begtrup LM, et al. Early Occupational Intervention for People with Low Back Pain in Physically Demanding Jobs: 1-year Follow-up Results of the Randomized Controlled GOBACK Trial. Spine. 2021 Mar 15;46(6):347-55. doi: https://dx.doi.org/10.1097/BRS.0000000000

003793. PMID: 33181779. **Exclusion:** Ineligible population

286. Rubira A, Rubira MC, Rubira LA, et al. Comparison of the effects of low-level laser and pulsed and continuous ultrasound on pain and physical disability in chronic non-specific low back pain: a randomized controlled clinical trial. Advances in Rheumatology. 2019 12 17;59(1):57. doi: https://dx.doi.org/10.1186/s42358-019-0099-z. PMID: 31847915. **Exclusion:** Inadequate duration of followup

287.* Sabet F, Ebrahimipour E, Mohammadipour F, et al. Effects of Swedish massage on gait spatiotemporal parameters in adult women with medial knee osteoarthritis: A randomized controlled trial. Journal of Bodywork & Movement Therapies. 2021 10;28:521-6. doi: https://dx.doi.org/10.1016/j.jbmt.2021.09.008. PMID: 34776188. **Exclusion:** Inadequate duration of follow-up

288. Salm DC, Belmonte LAO, Emer AA, et al. Aquatic exercise and Far Infrared (FIR) modulates pain and blood cytokines in fibromyalgia patients: A double-blind, randomized, placebo-controlled pilot study. Journal of Neuroimmunology. 2019 12 15;337:577077. doi: https://dx.doi.org/10.1016/j.jneuroim.2019.577077. PMID: 31655422.**Exclusion:** Ineligible intervention

289. Samami E, Shahhosseini Z, Elyasi F. The Effect of Psychological Interventions on the Quality of Life in Women with Fibromyalgia: A Systematic Review. Journal of Clinical Psychology in Medical Settings. 2021 09;28(3):503-17. doi: https://dx.doi.org/10.1007/s10880-021-09794-0. PMID: 34216335. **Exclusion:** Systematic Review used as source document

290. Sander LB, Paganini S, Terhorst Y, et al. Effectiveness of a Guided Web-Based Self-help Intervention to Prevent Depression in Patients With Persistent Back Pain: The PROD-BP Randomized Clinical Trial. JAMA Psychiatry. 2020 10 01;77(10):1001-11. doi: https://dx.doi.org/10.1001/jamapsychiatry.2020.1021. PMID: 32459348. **Exclusion:** Ineligible intervention

291. Sarig Bahat H, Hadar D, Treleaven J. Predictors for Positive Response to Home Kinematic Training in Chronic Neck Pain. Journal of Manipulative & Physiological Therapeutics. 2020 10;43(8):779-90. doi: https://dx.doi.org/10.1016/j.jmpt.2019.12.008. PMID: 32829943. **Exclusion:** Ineligible study design

292. Sarmento CVM, Moon S, Pfeifer T, et al. The therapeutic efficacy of Qigong exercise on the main symptoms of fibromyalgia: A pilot randomized clinical trial. Integrative Medicine Research. 2020 Dec;9(4):100416. doi: https://dx.doi.org/10.1016/j.imr.2020.100416. PMID: 32455108. **Exclusion:** Ineligible study design

293.* Sarzi-Puttini P. Mind and body therapies for fibromyalgia syndrome. Clinical and experimental rheumatology. 2021;39(3 SUPPL):S204-S5. PMID: CN-02305372 NEW. **Exclusion:** Systematic review, not directly used

294. Sato T, Shimizu K, Shiko Y, et al. Effects of Nintendo Ring Fit Adventure Exergame on Pain and Psychological Factors in Patients with Chronic Low Back Pain. Games for Health Journal. 2021 Jun;10(3):158-64. doi: https://dx.doi.org/10.1089/g4h.2020.0180. PMID: 33891508. **Exclusion:** Inadequate duration of followup

295. Sauch Valmana G, Vidal-Alaball J, Poch PR, et al. Effects of a Physical Exercise Program on Patients Affected with Fibromyalgia. Journal of Primary Care & Community Health. 2020 Jan-Dec;11:2150132720965071. doi: https://dx.doi.org/10.1177/2150132720965071. PMID: 33084477. **Exclusion:** Inadequate duration of followup

296. Schemer L, Schroeder A, Ornbol E, et al. Exposure and cognitive-behavioural therapy for chronic back pain: an RCT on treatment processes. European journal of pain (London, England). 2019;23(3):526-38. PMID: CN-01690849. **Exclusion:** Ineligible comparator

297. Schiller J, Karst M, Kellner T, et al. Combination of acupuncture and medical training therapy on tension type headache: Results of a randomised controlled pilot study. Cephalalgia. 2021 Jul;41(8):879-93. doi: https://dx.doi.org/10.1177/03331024219896

20. PMID: 33563049. **Exclusion:** Ineligible population

298. Schlenk EA, Fitzgerald GK, Rogers JC, et al. Promoting Physical Activity in Older Adults With Knee Osteoarthritis and Hypertension: A Randomized Controlled Trial. Journal of Aging & Physical Activity. 2020 09 04;29(2):207-18. doi: https://dx.doi.org/10.1123/japa.2019-0498. PMID: 32887850. **Exclusion:** Ineligible intervention

299. Schlicker S, Baumeister H, Buntrock C, et al. A Web- and Mobile-Based Intervention for Comorbid, Recurrent Depression in Patients With Chronic Back Pain on Sick Leave (Get.Back): Pilot Randomized Controlled Trial on Feasibility, User Satisfaction, and Effectiveness. JMIR Mental Health. 2020 Apr 15;7(4):e16398. doi: https://dx.doi.org/10.2196/16398. PMID: 32293577. **Exclusion:** Ineligible intervention

300. Schmid AA, Fruhauf CA, Sharp JL, et al. Yoga for People With Chronic Pain in a Community-Based Setting: A Feasibility and Pilot RCT. Journal of Evidence-based Integrative Medicine. 2019 Jan-Dec;24:2515690X19863763. doi: https://dx.doi.org/10.1177/2515690X19863763. PMID: 31394910. **Exclusion:** Ineligible population

301. Schmid AA, Van Puymbroeck M, Fruhauf CA, et al. Yoga improves occupational performance, depression, and daily activities for people with chronic pain. Work. 2019;63(2):181-9. doi: https://dx.doi.org/10.3233/WOR-192919. PMID: 31156199. **Exclusion:** Ineligible population

302. Schulze NB, Salemi MM, de Alencar GG, et al. Efficacy of Manual Therapy on Pain, Impact of Disease, and Quality of Life in the Treatment of Fibromyalgia: A Systematic Review. Pain Physician. 2020 09;23(5):461-76. PMID: 32967389. **Exclusion:** Systematic review used as source document

303. Seguin-Fowler R, Graham M, Ward J, et al. Feasibility of a yoga intervention to decrease pain in older women: a randomized controlled pilot study. BMC Geriatrics. 2020 10 12;20(1):400. doi: https://dx.doi.org/10.1186/s12877-020-01818-y. PMID: 33046009. **Exclusion:** Ineligible population

304. Serrat M, Coll-Omana M, Albajes K, et al. Efficacy of the FIBROWALK Multicomponent Program Moved to a Virtual Setting for Patients with Fibromyalgia during the COVID-19 Pandemic: A Proof-of-Concept RCT Performed Alongside the State of Alarm in Spain. International Journal of Environmental Research & Public Health [Electronic Resource]. 2021 09 30;18(19):30. doi: https://dx.doi.org/10.3390/ijerph181910300. PMID: 34639600. **Exclusion:** Inadequate duration of followup

305.* Serrat M, Sanabria-Mazo JP, Almirall M, et al. Effectiveness of a Multicomponent Treatment Based on Pain Neuroscience Education, Therapeutic Exercise, Cognitive Behavioral Therapy, and Mindfulness in Patients With Fibromyalgia (FIBROWALK Study): A Randomized Controlled Trial. Physical Therapy. 2021 12 01;101(12):01. doi: https://dx.doi.org/10.1093/ptj/pzab200. PMID: 34499174. **Exclusion:** Ineligible intervention

306. Shamsi M, Shahsavari S, Safari A, et al. A randomized clinical trial for the effect of static stretching and strengthening exercise on pelvic tilt angle in LBP patients. Journal of Bodywork & Movement Therapies. 2020 Jul;24(3):15-20. doi: https://dx.doi.org/10.1016/j.jbmt.2020.02.001. PMID: 32825981. **Exclusion:** Ineligible comparator

307. Sherman KJ, Wellman RD, Hawkes RJ, et al. T'ai Chi for Chronic Low Back Pain in Older Adults: A Feasibility Trial. Journal of Alternative & Complementary Medicine. 2020 Mar;26(3):176-89. doi: https://dx.doi.org/10.1089/acm.2019.0438. PMID: 32013530. **Exclusion:** Ineligible outcomes

308. Shimo K, Hasegawa M, Mizutani S, et al. Effects of a 12-week workplace counseling program on physical activity and low back pain: A pilot randomized controlled study. Journal of Back & Musculoskeletal Rehabilitation. 2021 Apr 30;30:30. doi: https://dx.doi.org/10.3233/BMR-200178. PMID: 33935064. **Exclusion:** Ineligible intervention

309. Shimoura K, Iijima H, Suzuki Y, et al. Immediate Effects of Transcutaneous Electrical Nerve Stimulation on Pain and Physical Performance in Individuals With Preradiographic Knee Osteoarthritis: a Randomized Controlled Trial. Archives of physical medicine and rehabilitation. 2019;100(2):300-6.e1. PMID: CN-02000235 NEW. **Exclusion:** Inadequate duration of followup

310. Simoni G, Bozzolan M, Bonnini S, et al. Effectiveness of standard cervical physiotherapy plus diaphragm manual therapy on pain in patients with chronic neck pain: A randomized controlled trial. Journal of Bodywork & Movement Therapies. 2021 Apr;26:481-91. doi: https://dx.doi.org/10.1016/j.jbmt.2020.12.032. PMID: 33992285. **Exclusion:** Ineligible intervention

311.* Singh A, Sethi J, Basavaraddi I. Effect of ardh matsyendrasana, om chanting and proprioceptive neuromuscular facilitation on cervical range of motion and health related quality of life in subacute bilateral mechanical neck pain: a randomised controlled trial. Journal of clinical and diagnostic research. 2021;15(10):YC06-YC10. PMID: CN-02336804 NEW. **Exclusion:** Inadequate duration of follow-up

312. Sitthipornvorakul E, Sihawong R, Waongenngarm P, et al. The effects of walking intervention on preventing neck pain in office workers: A randomized controlled trial. Journal of Occupational Health. 2020 Jan;62(1):e12106. doi: https://dx.doi.org/10.1002/1348-9585.12106. PMID: 31849170. **Exclusion:** Ineligible population

313. Skillgate E, Pico-Espinosa OJ, Cote P, et al. Effectiveness of deep tissue massage therapy, and supervised strengthening and stretching exercises for subacute or persistent disabling neck pain. The Stockholm Neck (STONE) randomized controlled trial. Musculoskeletal Science & Practice. 2020 02;45:102070. doi: https://dx.doi.org/10.1016/j.msksp.2019.102070. PMID: 31655314.**Exclusion:** Ineligible population

314. Smith J, Faux SG, Gardner T, et al. Reboot Online: A Randomized Controlled Trial Comparing an Online Multidisciplinary Pain Management Program with Usual Care for Chronic Pain. Pain Medicine. 2019 12 01;20(12):2385-96. doi: https://dx.doi.org/10.1093/pm/pnz208. PMID: 31498393. **Exclusion:** Ineligible population

315. Smith SL, Langen WH. A Systematic Review of Mindfulness Practices for Improving Outcomes in Chronic Low Back Pain. International Journal of Yoga. 2020 Sep-Dec;13(3):177-82. doi: https://dx.doi.org/10.4103/ijoy.IJOY_4_20. PMID: 33343146. **Exclusion:** Systematic review used as source document

316. Song HJ, Seo HJ, Kim D. Effectiveness of high-intensity laser therapy in the management of patients with knee osteoarthritis: A systematic review and meta-analysis of randomized controlled trials. Journal of Back & Musculoskeletal Rehabilitation. 2020;33(6):875-84. doi: https://dx.doi.org/10.3233/BMR-191738. PMID: 32831189. **Exclusion:** Systematic review used as source document

317. Sonmezer E, Ozkoslu MA, Yosmaoglu HB. The effects of clinical pilates exercises on functional disability, pain, quality of life and lumbopelvic stabilization in pregnant women with low back pain: A randomized controlled study. Journal of Back & Musculoskeletal Rehabilitation. 2021;34(1):69-76. doi: https://dx.doi.org/10.3233/BMR-191810. PMID: 32986655. **Exclusion:** Ineligible population

318. Stausholm MB, Naterstad IF, Joensen J, et al. Efficacy of low-level laser therapy on pain and disability in knee osteoarthritis: systematic review and meta-analysis of randomised placebo-controlled trials. BMJ Open. 2019 10 28;9(10):e031142. doi: https://dx.doi.org/10.1136/bmjopen-2019-031142. PMID: 31662383. **Exclusion:** Systematic review used as source document

319. Suman A, Schaafsma FG, van Dongen JM, et al. Effectiveness and cost-utility of a multifaceted eHealth strategy to improve back pain beliefs of patients with non-specific low back pain: a cluster randomised trial. BMJ Open. 2019 12 05;9(12):e030879. doi: https://dx.doi.org/10.1136/bmjopen-2019-030879. PMID: 31811006. **Exclusion:** Ineligible population

320. Susana CT, Maria TML, Pilar DS, et al. Effectiveness of self-applied acupressure for cervical pain of benign origin (EDIDO-CUH): a randomized controlled clinical trial. Acupuncture in Medicine. 2021 Oct;39(5):441-51. doi: https://dx.doi.org/10.1177/0964528420961398. PMID: 33280397. **Exclusion:** Ineligible population

321. Tan JS, Tikoft E, O'Sullivan P, et al. The Relationship Between Changes in Movement and Activity Limitation or Pain in People With Knee Osteoarthritis: A Systematic Review. Journal of Orthopaedic & Sports Physical Therapy. 2021 Oct;51(10):492-502. doi: https://dx.doi.org/10.2519/jospt.2021.10418. PMID: 34592828. **Exclusion:** Systematic Review used as source document

322. Teychenne M, Lamb KE, Main L, et al. General strength and conditioning versus motor control with manual therapy for improving depressive symptoms in chronic low back pain: A randomised feasibility trial. PLoS ONE [Electronic Resource]. 2019;14(8):e0220442. doi: https://dx.doi.org/10.1371/journal.pone.0220442. PMID: 31369613. **Exclusion:** Ineligible population

323. Thompson AR, Christopherson Z, Marshall LM, et al. A Pilot Randomized Controlled Trial for Aerobic and Strengthening Exercises on Physical Function and Pain for Hip Osteoarthritis. Pm & R. 2020 03;12(3):229-37. doi: https://dx.doi.org/10.1002/pmrj.12262. PMID: 31600429. **Exclusion:** Inadequate duration of followup

324. Tonye-Geoffroy L, Mauboussin Carlos S, Tuffet S, et al. Efficacy of a combination of hypnosis and transcutaneous electrical nerve stimulation for chronic non-cancer pain: A randomized controlled trial. Journal of Advanced Nursing. 2021 Jun;77(6):2875-86. doi: https://dx.doi.org/10.1111/jan.14833. PMID: 33783846. **Exclusion:** Ineligible population

325. Tse M, Li Y, Tang SK, et al. An Exploration of the Effectiveness of a Peer-Led Pain Management Program (PAP) for Nursing Home Residents with Chronic Pain and an Evaluation of Their Experiences: A Pilot Randomized Controlled Trial. International Journal of Environmental Research & Public Health [Electronic Resource]. 2020 06 08;17(11):08. doi: https://dx.doi.org/10.3390/ijerph17114090. PMID: 32521785. **Exclusion:** Ineligible population

326. Tsuboi Y, Oka T, Nakatsuka K, et al. Effectiveness of workplace active rest programme on low back pain in office workers: a stepped-wedge cluster randomised controlled trial. BMJ Open. 2021 06 25;11(6):e040101. doi: https://dx.doi.org/10.1136/bmjopen-2020-040101. PMID: 34172540. **Exclusion:** Ineligible study design

327. Tu JF, Wang LQ, Shi GX, et al. Effect of acupuncture on knee injury and osteoarthritis outcome score in patients with knee osteoarthritis. Zhongguo zhen jiu [Chinese acupuncture & moxibustion]. 2021;41(1):27-30. PMID: CN-02232691 NEW. **Exclusion:** Not English language but possibly relevant

328. Tu JF, Wang LQ, Shi GX, et al. [Effect of acupuncture on knee injury and osteoarthritis outcome score in patients with knee osteoarthritis]. Zhongguo Zhenjiu. 2021 Jan 12;41(1):27-30. doi: https://dx.doi.org/10.13703/j.0255-2930.20191212-0001. PMID: 33559438. **Exclusion:** Not English language but possibly relevant

329. Turner MN, Hernandez DO, Cade W, et al. The Role of Resistance Training Dosing on Pain and Physical Function in Individuals With Knee Osteoarthritis: A Systematic Review. Sports & Health. 2020 Mar/Apr;12(2):200-6. doi: https://dx.doi.org/10.1177/1941738119887183. PMID: 31850826. **Exclusion:** Systematic review used as source document

330. Udina-Cortes C, Fernandez-Carnero J, Romano AA, et al. Effects of neuro-adaptive electrostimulation therapy on pain and disability in fibromyalgia: A prospective, randomized, double-blind study. Medicine. 2020 Dec 18;99(51):e23785. doi: https://dx.doi.org/10.1097/MD.0000000000023785. PMID: 33371148. **Exclusion:** Ineligible intervention

331. Uebelacker LA, Van Noppen D, Tremont G, et al. A pilot study assessing acceptability and feasibility of hatha yoga for chronic

pain in people receiving opioid agonist therapy for opioid use disorder. Journal of Substance Abuse Treatment. 2019 10;105:19-27. doi: https://dx.doi.org/10.1016/j.jsat.2019.07.015 . PMID: 31443887. **Exclusion:** Ineligible population

332. Ughreja RA, Venkatesan P, Balebail Gopalakrishna D, et al. Effectiveness of myofascial release on pain, sleep, and quality of life in patients with fibromyalgia syndrome: A systematic review. Complementary Therapies in Clinical Practice. 2021 Nov;45:101477. doi: https://dx.doi.org/10.1016/j.ctcp.2021.101477. PMID: 34507243. **Exclusion:** Systematic Review used as source document

333. Vaegter HB, Ussing K, Johansen JV, et al. Improvements in clinical pain and experimental pain sensitivity after cognitive functional therapy in patients with severe persistent low back pain. The Pain Report. 2020 Jan-Feb;5(1):e802. doi: https://dx.doi.org/10.1097/PR9.0000000000000802. PMID: 32072097. **Exclusion:** Ineligible study design

334. Valera-Calero A, Lluch Girbes E, Gallego-Izquierdo T, et al. Endocrine response after cervical manipulation and mobilization in people with chronic mechanical neck pain: a randomized controlled trial. European journal of physical and rehabilitation medicine. 2019;55(6):792-805. PMID: CN-01690485. **Exclusion:** Inadequate duration of followup

335. Van Dyke BP, Newman AK, Morais CA, et al. Heterogeneity of Treatment Effects in a Randomized Trial of Literacy-Adapted Group Cognitive-Behavioral Therapy, Pain Psychoeducation, and Usual Medical Care for Multiply Disadvantaged Patients With Chronic Pain. Journal of Pain. 2019 10;20(10):1236-48. doi: https://dx.doi.org/10.1016/j.jpain.2019.04.006. PMID: 31022555. **Exclusion:** Ineligible population

336.* Vance C, Zimmerman MB, Dailey D, et al. Reduction in movement-evoked pain and fatigue during initial Transcutaneous Electrical Nerve Stimulation treatment predicts responders in women with fibromyalgia. Journal of pain. 2021;22(5):608-9. PMID: CN-02273867 NEW. **Exclusion:** Ineligible study design

337.* Vance CGT, Zimmerman MB, Dailey DL, et al. Reduction in movement-evoked pain and fatigue during initial 30-minute transcutaneous electrical nerve stimulation treatment predicts transcutaneous electrical nerve stimulation responders in women with fibromyalgia. Pain. 2021 May 1;162(5):1545-55. doi: 10.1097/j.pain.0000000000002144. PMID: 33230010. **Exclusion:** Inadequate duration of follow-up

338. Vasiliou VS, Karademas EC, Christou Y, et al. Acceptance and Commitment Therapy for Primary Headache Sufferers: A Randomized Controlled Trial of Efficacy. Journal of Pain. 2021 02;22(2):143-60. doi: https://dx.doi.org/10.1016/j.jpain.2020.06.006. PMID: 32682815. **Exclusion:** Ineligible population

339. Veronese N, Smith L, Bolzetta F, et al. Efficacy of conservative treatments for hand osteoarthritis : An umbrella review of interventional studies. Wiener Klinische Wochenschrift. 2021 Mar;133(5-6):234-40. doi: https://dx.doi.org/10.1007/s00508-020-01702-0. PMID: 32607645. **Exclusion:** Systematic review used as source document

340. Villafaina S, Collado-Mateo D, Dominguez-Munoz FJ, et al. Effects of exergames on heart rate variability of women with fibromyalgia: A randomized controlled trial. Scientific Reports. 2020 03 20;10(1):5168. doi: https://dx.doi.org/10.1038/s41598-020-61617-8. PMID: 32198423. **Exclusion:** Ineligible outcomes

341.* Villanueva-Ruiz I, Falla D, Lascurain-Aguirrebena I. Effectiveness of Specific Neck Exercise for Nonspecific Neck Pain; Usefulness of Strategies for Patient Selection and Tailored Exercise-A Systematic Review With Meta-Analysis. Physical Therapy. 2022 02 01;102(2):01. doi: https://dx.doi.org/10.1093/ptj/pzab259. PMID: 34935963. **Exclusion:** Systematic review, not directly used

342. Vining R, Long CR, Minkalis A, et al. Effects of Chiropractic Care on Strength, Balance, and Endurance in Active-Duty U.S. Military Personnel with Low Back Pain: A Randomized Controlled Trial. Journal of Alternative & Complementary Medicine.

2020 Jul;26(7):592-601. doi: https://dx.doi.org/10.1089/acm.2020.0107. PMID: 32543211. **Exclusion:** Inadequate duration of followup

343.* Vitiello MV, Zhu W, Von Korff M, et al. Long-term improvements in sleep, pain, depression, and fatigue in older adults with comorbid osteoarthritis pain and insomnia. Sleep. 2022 02 14;45(2):14. doi: https://dx.doi.org/10.1093/sleep/zsab231. PMID: 34516646. **Exclusion:** Ineligible population

344.* Vizdoaga A, Salaru V, Cebanu M, et al. Comparison of the effect of different physical therapy program in the rehabilitation of knee osteoarthritis patients. Annals of the rheumatic diseases. 2021;80(SUPPL 1):1337-. PMID: CN-02303791 NEW. **Exclusion:** Ineligible study design

345. Walsh N, Jones L, Phillips S, et al. Facilitating Activity and Self-management for people with Arthritic knee, hip or lower back pain (FASA): A cluster randomised controlled trial. Musculoskeletal Science & Practice. 2020 12;50:102271. doi: https://dx.doi.org/10.1016/j.msksp.2020.102271. PMID: 33068901. **Exclusion:** Ineligible intervention

346. Wang F, Zhang X, Tong X, et al. The effects on pain, physical function, and quality of life of quadriceps strengthening exercises combined with Baduanjin qigong in older adults with knee osteoarthritis: a quasi-experimental study. BMC Musculoskeletal Disorders. 2021 Mar 29;22(1):313. doi: https://dx.doi.org/10.1186/s12891-021-04179-8. PMID: 33781238. **Exclusion:** Ineligible study design

347. Wang S, Chan PPK, Lam BMF, et al. Sensor-Based Gait Retraining Lowers Knee Adduction Moment and Improves Symptoms in Patients with Knee Osteoarthritis: a Randomized Controlled Trial. Sensors. 2021;21(16) PMID: CN-02306300 NEW. **Exclusion**: Inadequate duration of followup

348. Williams ACC, Fisher E, Hearn L, et al. Psychological therapies for the management of chronic pain (excluding headache) in adults. Cochrane Database of Systematic Reviews. 2020 08 12;8:CD007407. doi: https://dx.doi.org/10.1002/14651858.CD007407.pub4. PMID: 32794606. **Exclusion:** Systematic review used as source document

349. Wippert PM, Drieslein D, Beck H, et al. The Feasibility and Effectiveness of a New Practical Multidisciplinary Treatment for Low-Back Pain: A Randomized Controlled Trial. Journal of Clinical Medicine. 2019 Dec 31;9(1):31. doi: https://dx.doi.org/10.3390/jcm9010115. PMID: 31906224. **Exclusion:** Ineligible population

350.* Wu Q, Zhao J, Guo W. Efficacy of massage therapy in improving outcomes in knee osteoarthritis: A systematic review and meta-analysis. Complementary Therapies in Clinical Practice. 2022 Feb;46:101522. doi: https://dx.doi.org/10.1016/j.ctcp.2021.101522. PMID: 34890892. **Exclusion:** Systematic review, not directly used

351.* Wu Y, Zhu F, Chen W, et al. Effects of transcutaneous electrical nerve stimulation (TENS) in people with knee osteoarthritis: A systematic review and meta-analysis. Clinical Rehabilitation. 2022 Apr;36(4):472-85. doi: https://dx.doi.org/10.1177/02692155211065636. PMID: 34971318. **Exclusion:** Systematic review, not directly used

352. Wu YL, Fang SC, Chen SC, et al. Effects of Neurofeedback on Fibromyalgia: A Randomized Controlled Trial. Pain Management Nursing. 2021 Feb 09;09:09. doi: https://dx.doi.org/10.1016/j.pmn.2021.01.004. PMID: 33579615. **Exclusion:** Inadequate duration of followup

353. Xiao C, Zhuang Y, Kang Y. Effects of Wu Qin xi Qigong exercise on physical functioning in elderly people with knee osteoarthritis: A randomized controlled trial. Geriatrics & gerontology international. 2020 Oct;20(10):899-903. doi: https://dx.doi.org/10.1111/ggi.14007. PMID: 32886828. **Exclusion:** Inadequate duration of followup

354. Xie SH, Wang Q, Wang LQ, et al. Effect of Internet-Based Rehabilitation Programs on Improvement of Pain and Physical Function in Patients with Knee Osteoarthritis: Systematic Review and Meta-analysis of Randomized Controlled Trials. Journal of Medical Internet Research. 2021 01 05;23(1):e21542. doi:

https://dx.doi.org/10.2196/21542. PMID: 33399542. **Exclusion:** Systematic review used as source document

355.* Xie YH, Liao MX, Wang MY, et al. Traditional Chinese Mind and Body Exercises for Neck Pain: A Meta-Analysis of Randomized Controlled Trials. Pain Research & Management. 2021;2021:5426595. doi: https://dx.doi.org/10.1155/2021/5426595. PMID: 34630786 .**Exclusion:** Systematic review, not directly used

356. Yang Q, Yu S, Wang J, et al. Effects of Baduanjin on patients with chronic nonspecific low back pain: A randomized controlled trial. Medicine. 2021 Jan 29;100(4):e24448. doi: https://dx.doi.org/10.1097/MD.0000000000024448. PMID: 33530252. **Exclusion:** Not a study

357. Yao C, Li Z, Zhang S, et al. Effects of Wuqinxi in the Patients with Chronic Low Back Pain: A Randomized Controlled Trial. Evidence-Based Complementary & Alternative Medicine: eCAM. 2020;2020:1428246. doi: https://dx.doi.org/10.1155/2020/1428246. PMID: 32908554. **Exclusion:** Ineligible comparator

358. Ye J, Zheng Q, Zou L, et al. Mindful Exercise (Baduanjin) as an Adjuvant Treatment for Older Adults (60 Years Old and Over) of Knee Osteoarthritis: A Randomized Controlled Trial. Evidence-Based Complementary & Alternative Medicine: eCAM. 2020;2020:9869161. doi: https://dx.doi.org/10.1155/2020/9869161. PMID: 32617115. **Exclusion:** Inadequate duration of followup

359. Yeh SW, Hong CH, Shih MC, et al. Low-Level Laser Therapy for Fibromyalgia: A Systematic Review and Meta-Analysis. Pain Physician. 2019 05;22(3):241-54. PMID: 31151332. **Exclusion:** Systematic review used as source document

360. Yoo SA, Kim CY, Kim HD, et al. Effects of progressive muscle relaxation therapy with home exercise on pain, fatigue, and stress in subjects with fibromyalgia syndrome: A pilot randomized controlled trial. Journal of Back & Musculoskeletal Rehabilitation. 2021 Jun 15;15:15. doi: https://dx.doi.org/10.3233/BMR-191703. PMID: 34151818. **Exclusion:** Inadequate duration of followup

361. You Y, Liu J, Tang M, et al. Effects of Tai Chi exercise on improving walking function and posture control in elderly patients with knee osteoarthritis: A systematic review and meta-analysis. Medicine. 2021 Apr 23;100(16):e25655. doi: https://dx.doi.org/10.1097/MD.0000000000025655. PMID: 33879749. **Exclusion:** Systematic review used as source document

362.* Yu WZ, Huang CM, Ng HP, et al. Distal Acupoints Outperform Proximal Acupoints in Treating Knee Osteoarthritis: a Randomized Controlled Trial. Evidence based complementary and alternative medicine. 2021;2021 PMID: CN-02326331 NEW. **Exclusion:** Inadequate duration of follow-up

363. Zaworski K, Latosiewicz R. The effectiveness of manual therapy and proprioceptive neuromuscular facilitation compared to kinesiotherapy: a four-arm randomized controlled trial. European journal of physical & rehabilitation medicine. 2021 Apr;57(2):280-7. doi: https://dx.doi.org/10.23736/S1973-9087.21.06344-9. PMID: 33650840. **Exclusion:** Ineligible population

364. Zhang C, Li Y, Zhong Y, et al. Effectiveness of motor control exercise on non-specific chronic low back pain, disability and core muscle morphological characteristics: A meta-analysis of randomized controlled trials. European journal of physical & rehabilitation medicine. 2021 May 07;07:07. doi: https://dx.doi.org/10.23736/S1973-9087.21.06555-2. PMID: 33960180. **Exclusion:** Systematic review used as source document

365. Zhang L, Yuan H, Zhang L, et al. Effect of acupuncture therapies combined with usual medical care on knee osteoarthritis. Journal of traditional chinese medicine = chung i tsa chih ying wen pan. 2019;39(1):103-10. PMID: CN-02133212 NEW.Exclusion: Inadequate duration of followup

366. Zhang Q, Fang J, Chen L, et al. Different kinds of acupuncture treatments for knee osteoarthritis: a multicentre, randomized controlled trial. Trials [Electronic Resource]. 2020 Mar 14;21(1):264. doi: https://dx.doi.org/10.1186/s13063-019-

4034-8. PMID: 32171318. **Exclusion:** Not a study

367. Zhao L, Cheng K, Wu F, et al. Effect of Laser Moxibustion for Knee Osteoarthritis: A Multisite, Double-blind Randomized Controlled Trial. Journal of Rheumatology. 2021 Jun;48(6):924-32. doi: https://dx.doi.org/10.3899/jrheum.200217. PMID: 32611673 .**Exclusion:** Ineligible intervention

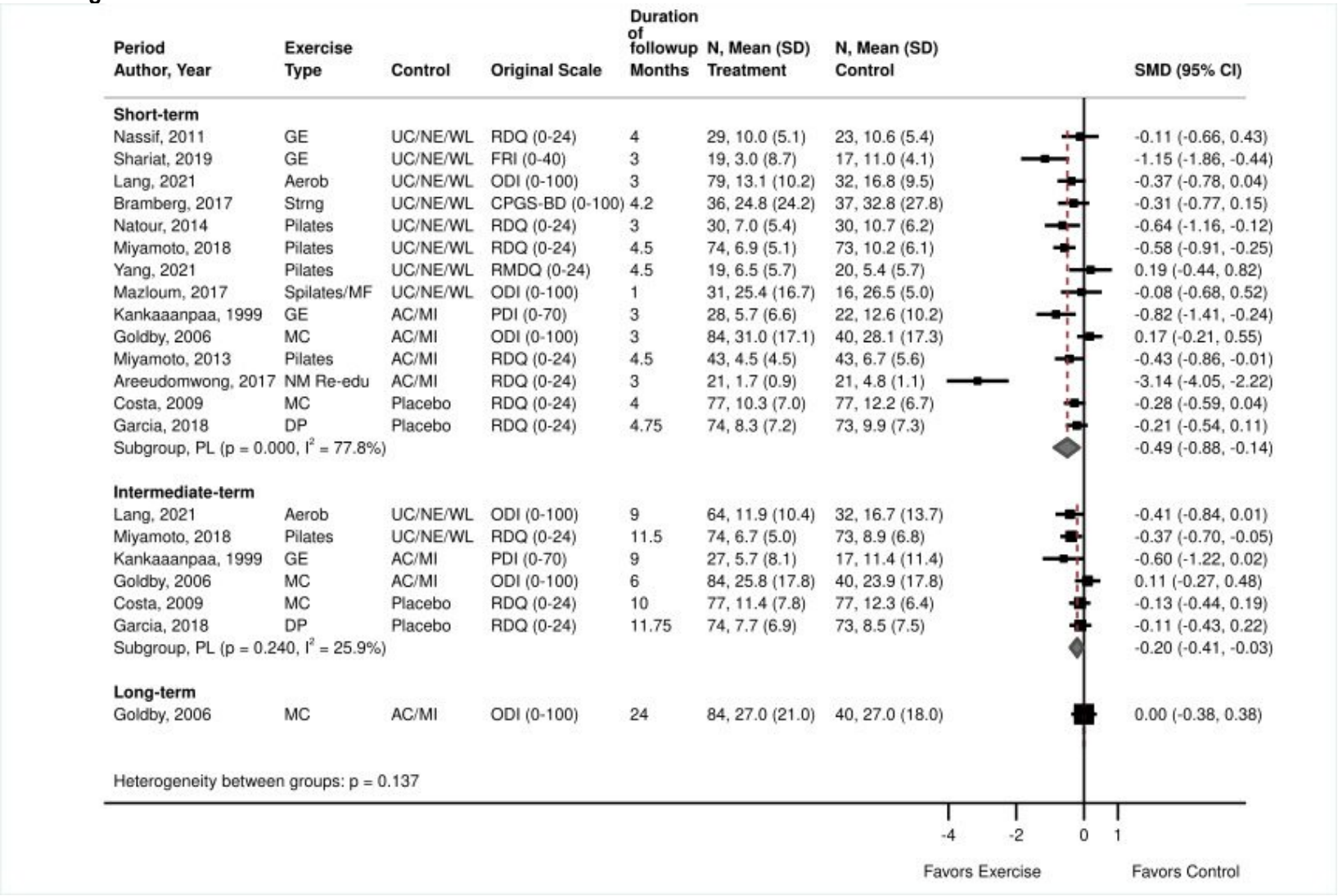
368. Zheng Z, Gibson S, Helme RD, et al. Effects of Electroacupuncture on Opioid Consumption in Patients with Chronic Musculoskeletal Pain: a Multicenter Randomized Controlled Trial. Pain medicine (Malden, Mass.). 2019;20(2):397-410. PMID: CN-01943577. **Exclusion:** Ineligible population

369. Zhu F, Zhang M, Wang D, et al. Yoga compared to non-exercise or physical therapy exercise on pain, disability, and quality of life for patients with chronic low back pain: A systematic review and meta-analysis of randomized controlled trials. PLoS ONE [Electronic Resource]. 2020;15(9):e0238544. doi: https://dx.doi.org/10.1371/journal.pone.0238544. PMID: 32870936. **Exclusion:** Systematic review used as source document

*Studies excluded from the last surveillance report

Appendix G. Updated or New Meta-Analyses

Figure G-1. Exercise versus usual care, an attention control, or a placebo intervention for chronic low back pain:[a] effects on function, excluding outlier trial[b]

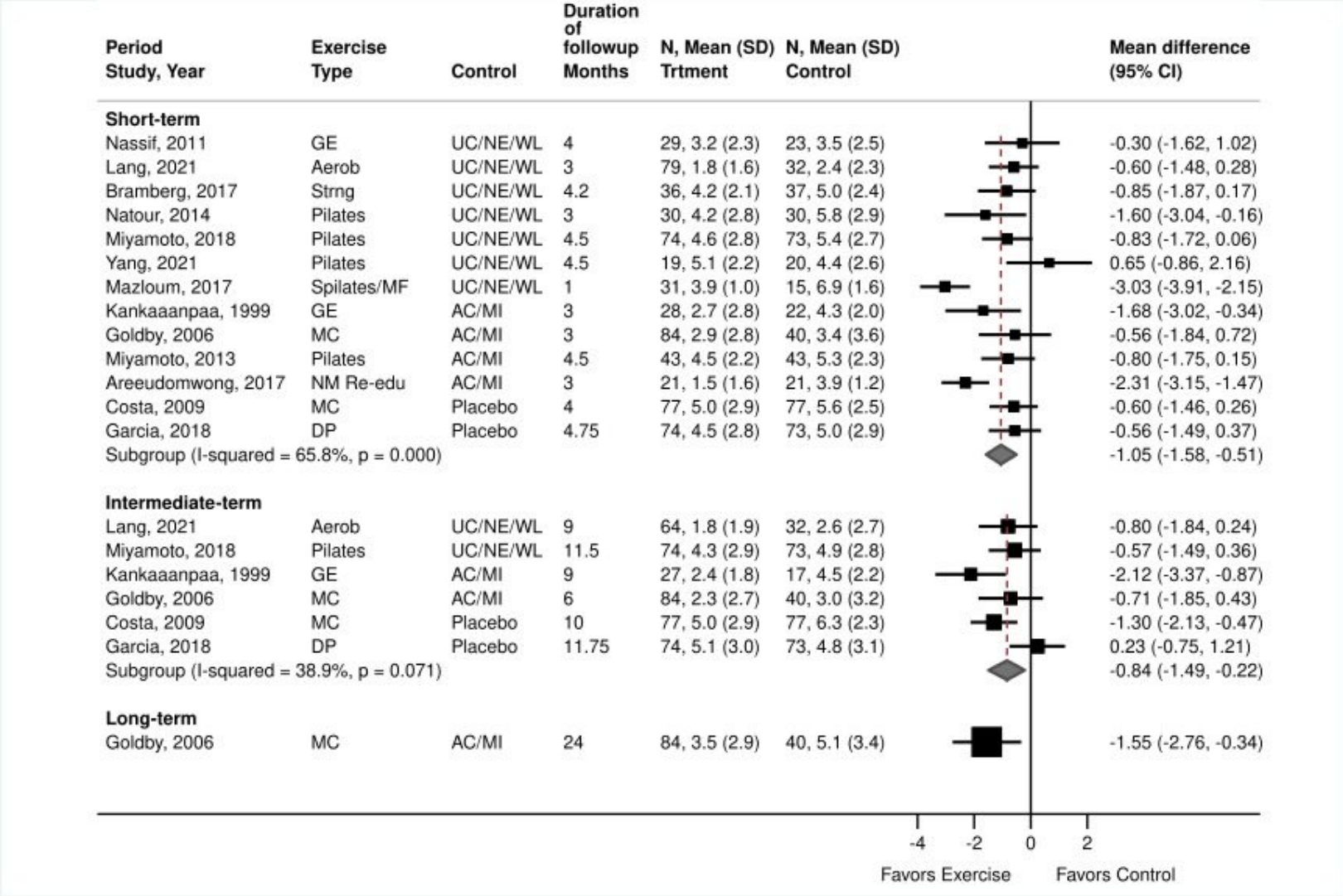


AC = attention control; AE = aerobic exercise (walking); CI = confidence interval; CPGS –BD =Von Korff Chronic Pain Grade Score Back Disability; DP = directional preference; GE= general exercise; MC = motor control; MF = mobility/flexibility; MI = minimal intervention; N = number; NE = no exercise; NM = neuromuscular re-education; ODI = Oswestry Disability Index; PDI = Pain Disability Index; PL = profile likelihood; RDQ = Roland-Morris Disability Questionnaire; SD = standard deviation; SMD = standardized mean difference; Spilates = selective Pilates; Strng=Strength training; UC = usual care; WL = waitlist

[a] Newly included trials since the original 2020 systematic review: Shariat 2019, Lang 2021 (Surveillance Report 1), Yang 2021 (Surveillance Report 3)

[b] Areeudomwong 2017, included in prior report.

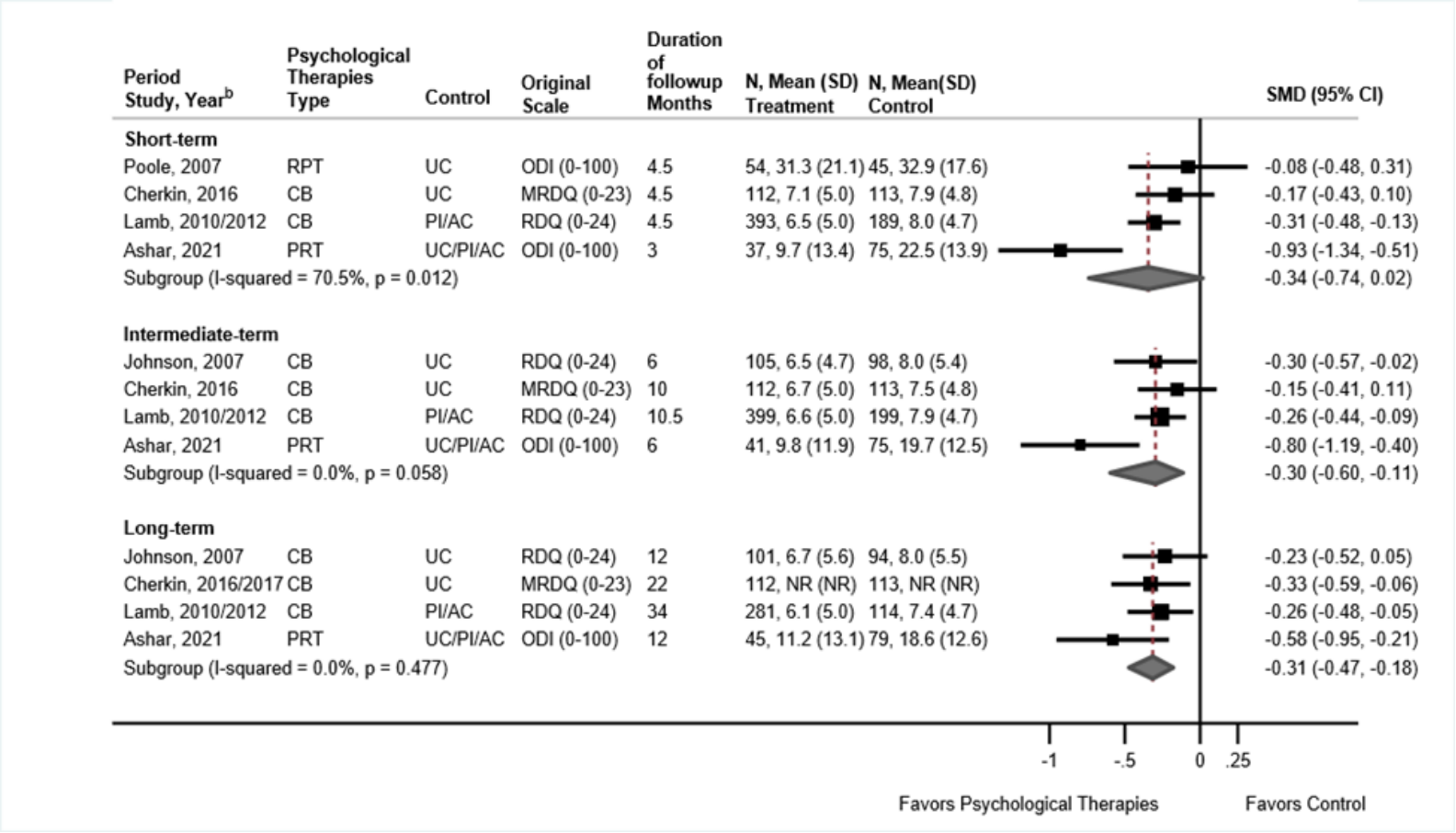
Figure G-2. Exercise versus usual care, an attention control, or a placebo intervention for chronic low back pain: effects on pain[a]



AC = attention control; AE = aerobic exercise (walking); CI = confidence interval; DP = directional preference; GE= general exercise; MC = motor control; MF = mobility/flexibility; MI = minimal intervention; N = number; NE = no exercise; NM = neuromuscular re-education; SD = standard deviation; Spilates = selective Pilates; Strng=Strength training; UC = usual care; WL = waitlist.

[a] Newly included trials since the original 2020 systematic review: Lang 2021 (Surveillance Report 1), Yang 2021 (Surveillance Report 3)

Figure G-3. Psychological therapy versus usual care or an attention control for chronic low back pain: effects on function, excluding outlier trial[a]

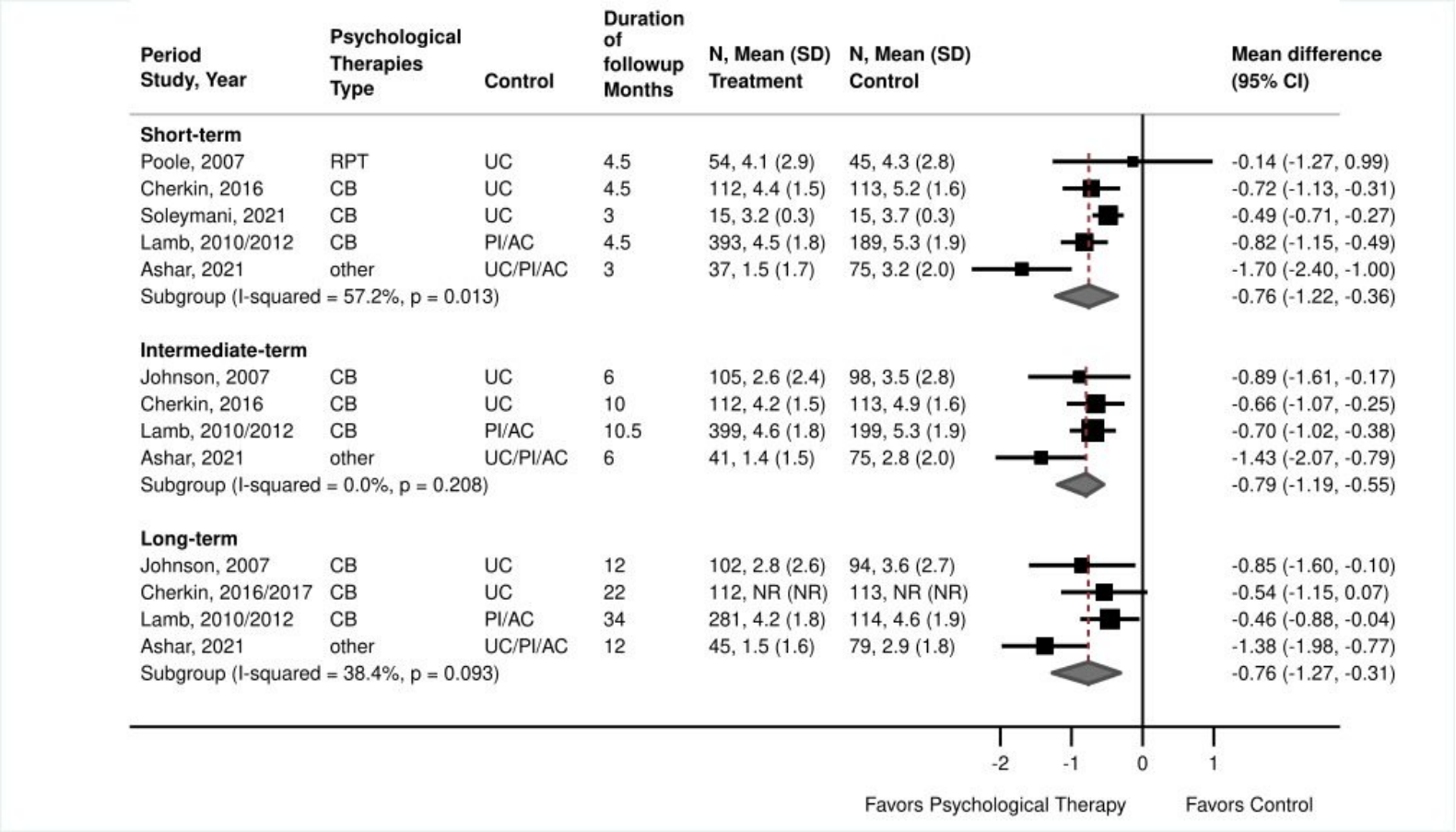


AC = attention control; CB = cognitive-behavioral therapy; CI = confidence interval; MRDQ = Modified Roland-Morris Disability Questionnaire; N = number; ODI = Oswestry Disability Index; PI = placebo intervention; PRT = pain reprocessing therapy; RDQ = Roland-Morris Disability Questionnaire; RPT = respondent therapy (progressive relaxation); SD = standard deviation; SMD = standardized mean difference; UC = usual care

[a] Shariat 2019, new trial (Surveillance Report 1).

[b] Newly included trial since the original 2020 systematic review: Ashar 2021 (Surveillance Report 1)

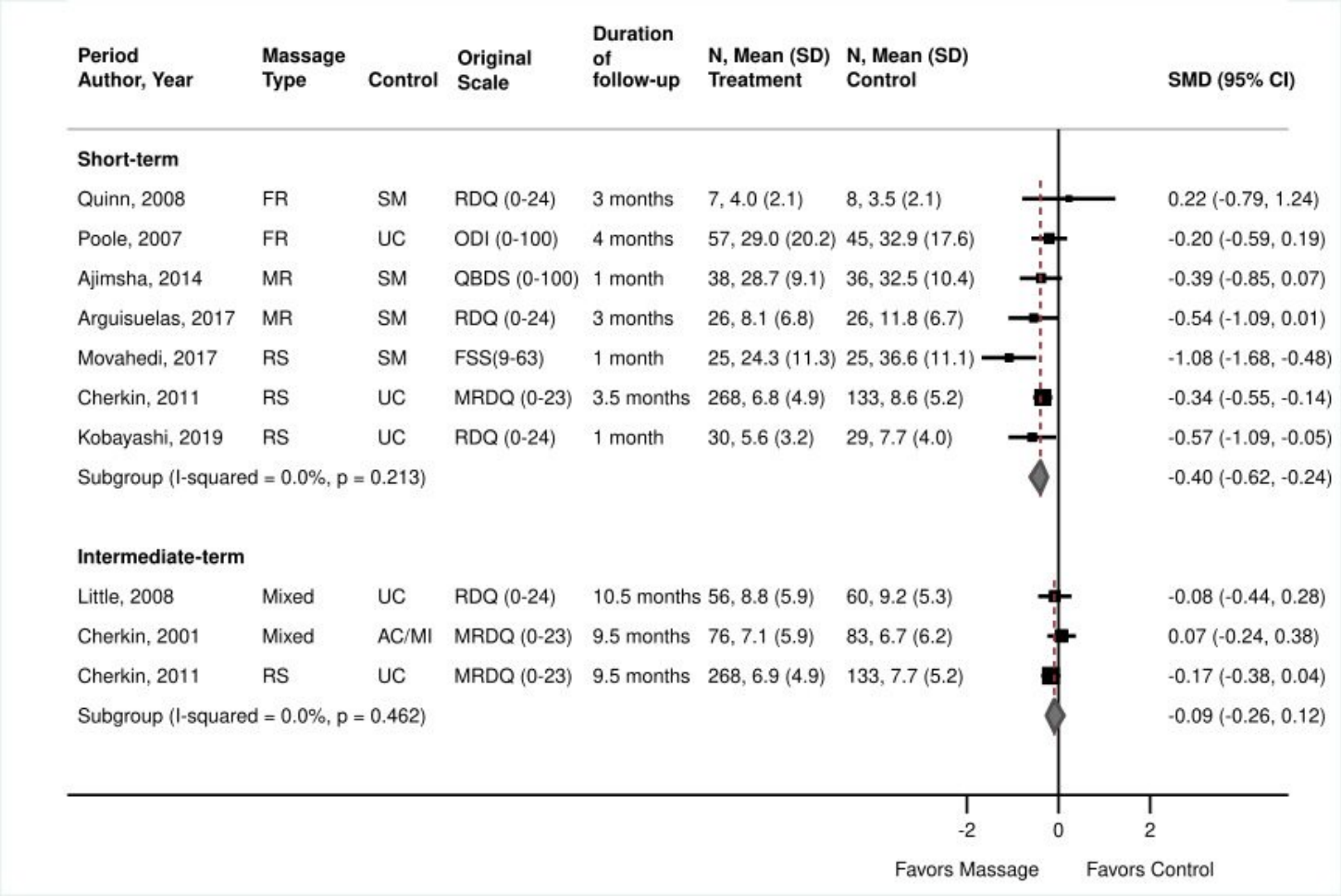
Figure G-4. Psychological therapy versus usual care or an attention control for chronic low back pain: effects on pain[a]



AC = attention control; CB = cognitive-behavioral therapy; CI = confidence interval; N = number; PI = placebo intervention; PRT = pain reprocessing therapy; RPT = respondent therapy (progressive relaxation); SD = standard deviation; UC = usual care.

[a] Newly included trials since the original 2020 systematic review: Ashar 2021 (Surveillance Report 1), Soleymani 2021 (Surveillance Report 3)

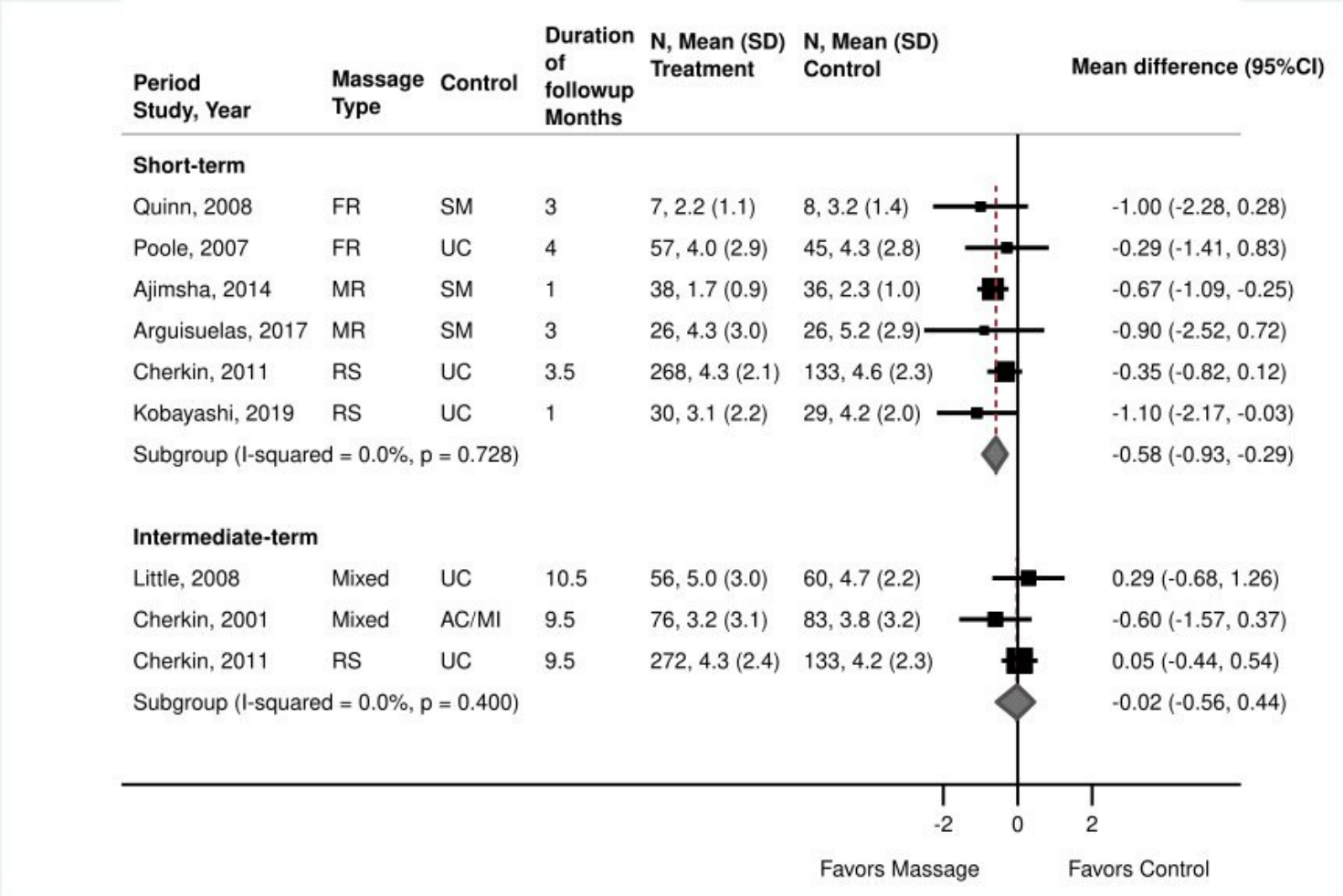
Figure G-5. Massage versus sham, usual care, or an attention control for chronic low back pain: effects on function[a]



AC = attention control; CI = confidence interval; FR = foot reflexology; FSS = Fatigue Severity Scale; MI = minimal intervention; MRDQ = Modified Roland-Morris Disability Questionnaire; MR = myofascial release; N = number; QBDS = Quebec Back Pain Disability Scale; RDQ = Roland-Morris Disability Questionnaire; RS = relaxation/structural; SD = standard deviation; SM = sham massage, SMD = standardized mean difference; UC = usual care.

[a] Newly included trial since the original 2020 systematic review: Kobayashi 2019 (Surveillance Report 1)

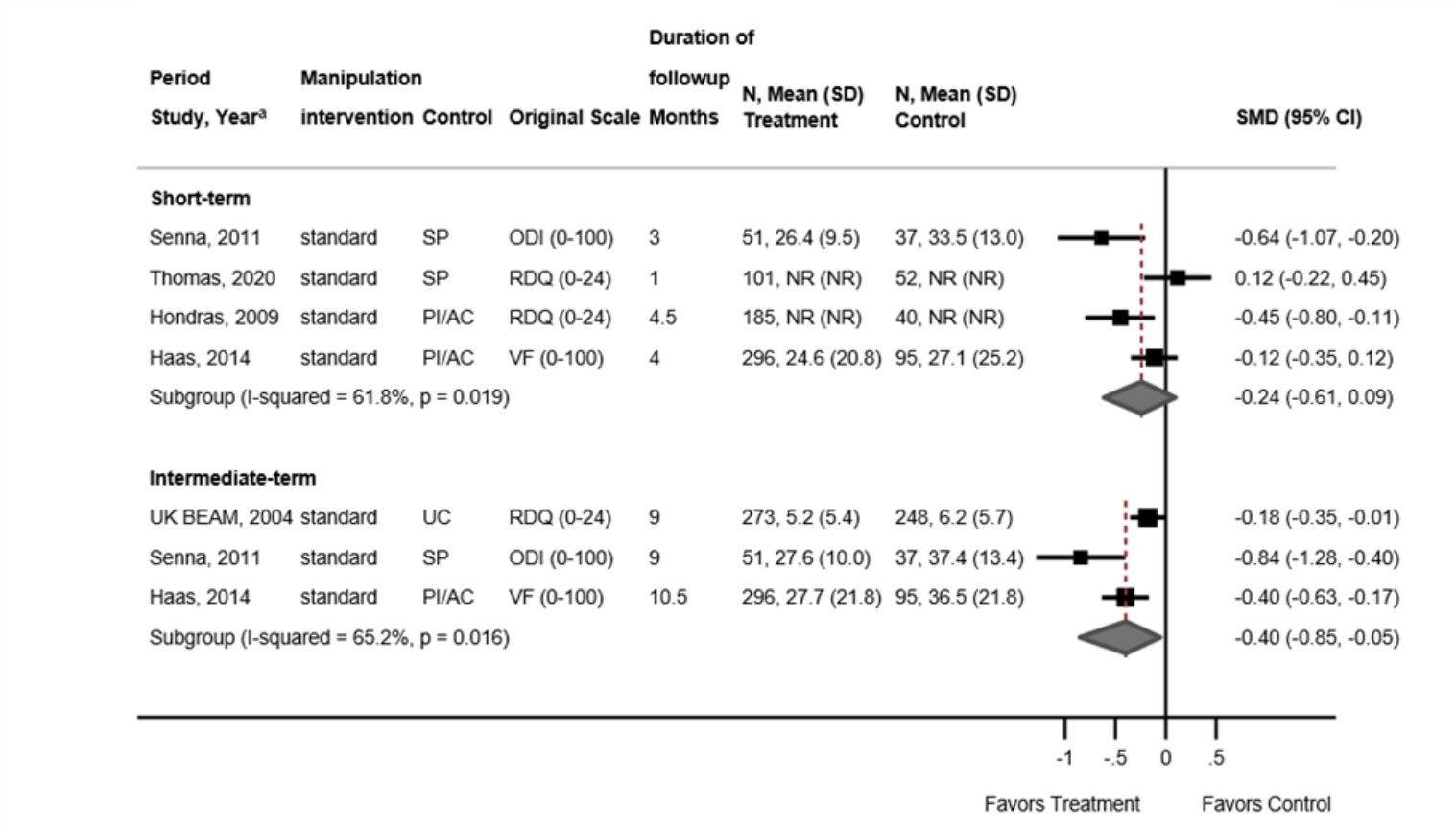
Figure G-6. Massage versus sham, usual care, or an attention control for chronic low back pain: effects on pain[a]



AC = attention control; CI = confidence interval; FR = foot reflexology; MI = minimal intervention; MR = myofascial release; N = number; RS = relaxation/structural; SD = standard deviation; SM = sham massage, UC = usual care.

[a] Newly included trial since the original 2020 systematic review: Kobayashi 2019 (Surveillance Report 1)

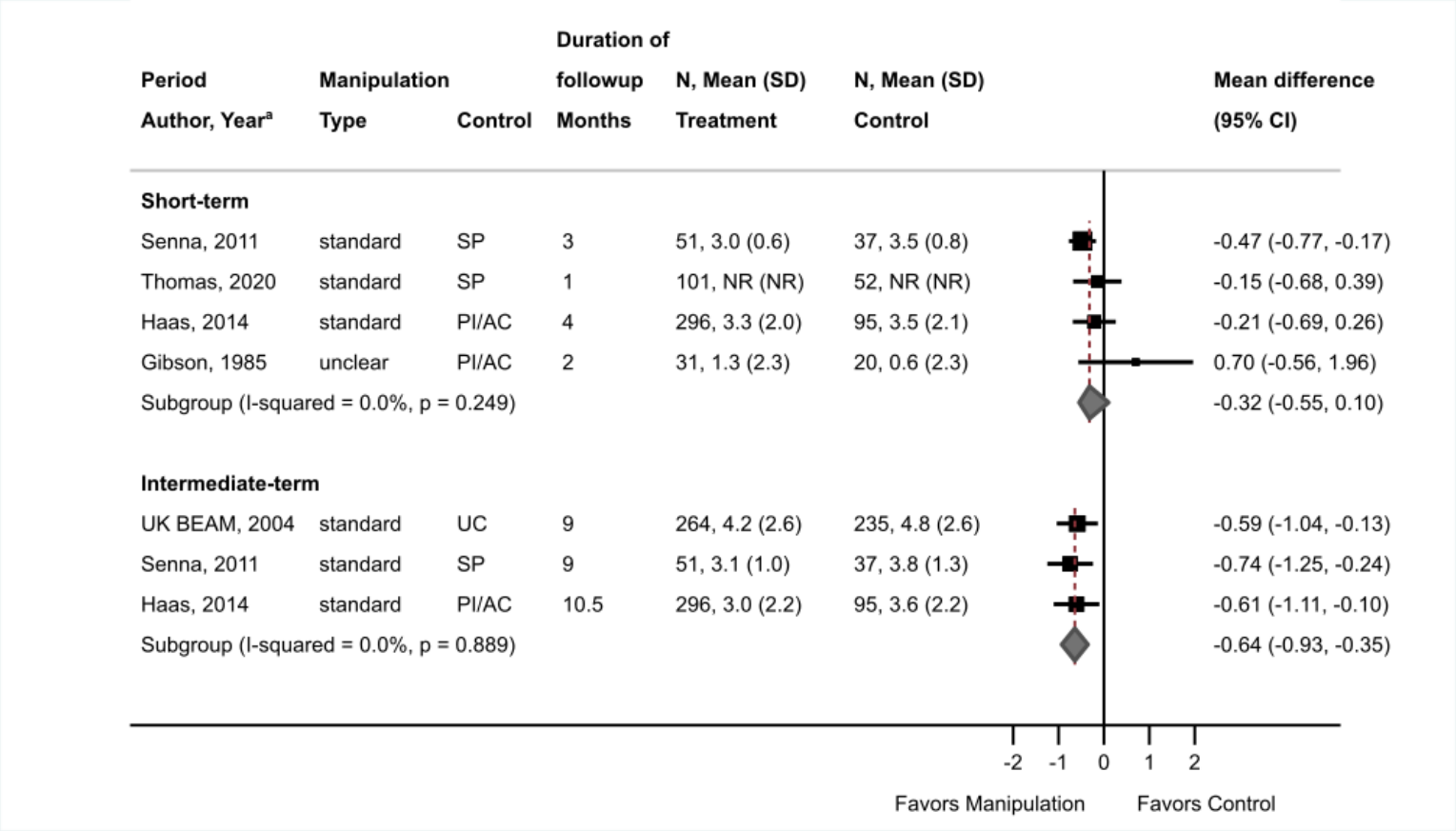
Figure G-7. Spinal manipulation versus sham manipulation, usual care, an attention control, or a placebo intervention for chronic low back pain: effects on function



AC = attention control; CI = confidence interval; N = number; NR = not reported; ODI = Oswestry Disability Index; PI = placebo intervention; RDQ = Roland-Morris Disability Questionnaire; SD = standard deviation; SMD = standardized mean difference; SP = sham manipulation; UC = usual care; UK BEAM = UK Back pain exercise and manipulation trial; VF = Von Korff functional disability.

[a] Newly included trial since the original 2020 systematic review: Thomas 2020 (Surveillance Report 1)

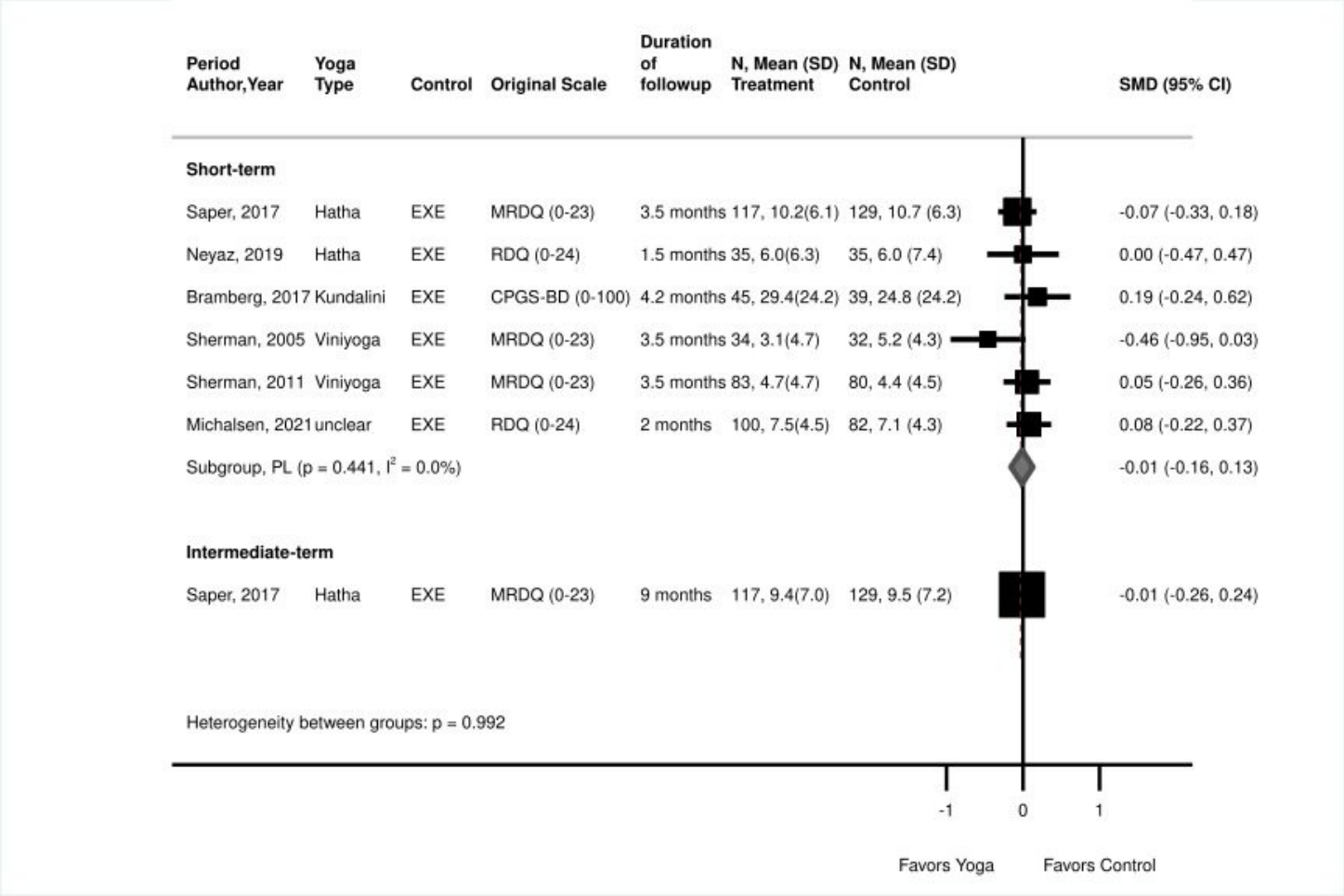
Figure G-8. Spinal manipulation versus sham manipulation, usual care, an attention control, or a placebo intervention for chronic low back pain: effects on pain



AC = attention control; CI = confidence interval; N = number; NR = not reported; PI = placebo intervention; SD = standard deviation; SP = sham manipulation; UC = usual care; UK BEAM = UK Back pain exercise and manipulation trial.

[a] Newly included trial since the original 2020 systematic review: Thomas 2020 (Surveillance Report 1)

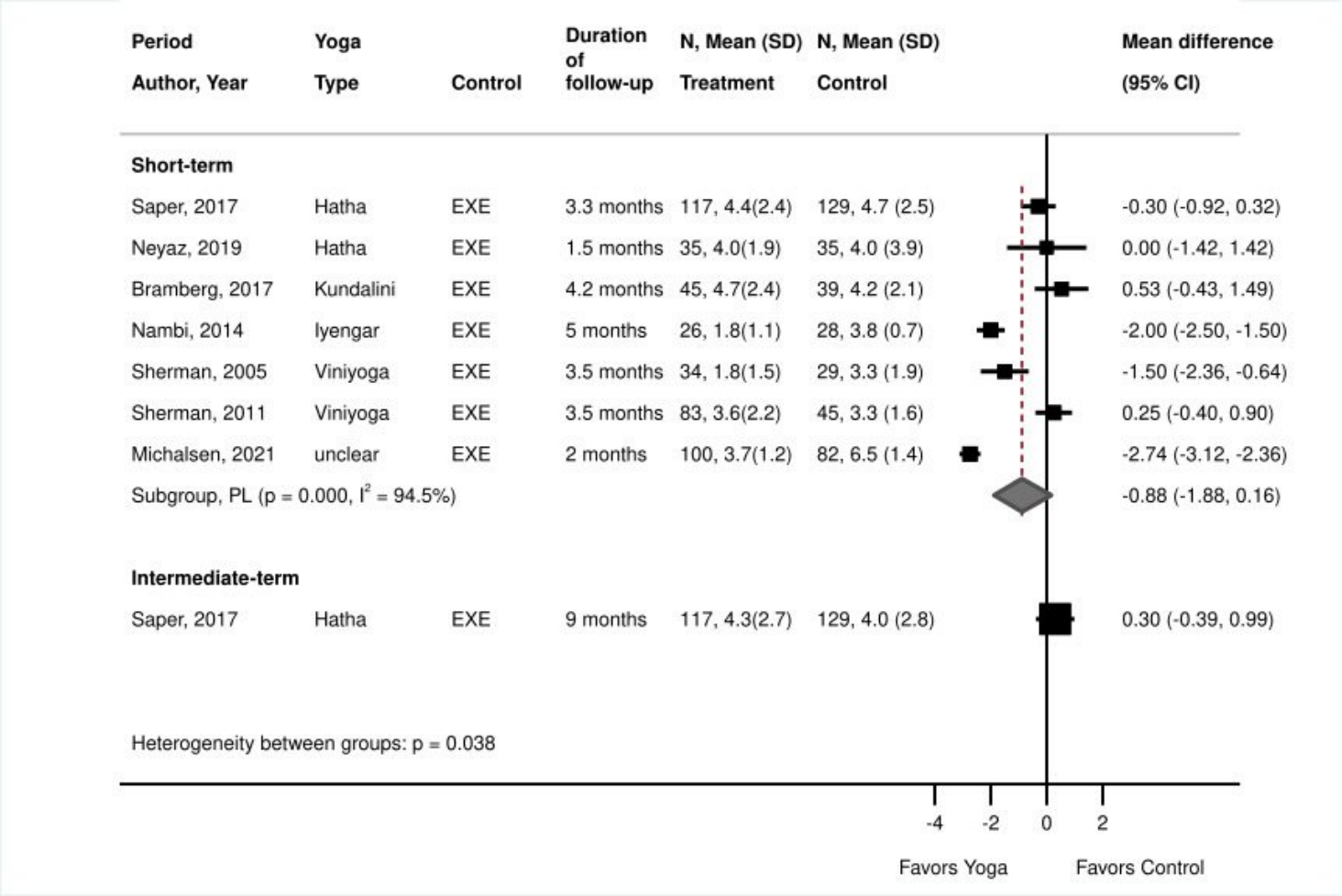
Figure G-9. Mind-body therapies versus exercise for chronic low back pain: effects on function[a]



CI = confidence interval; CPGS=Von Korff Chronic Pain Grade Score; EXE = exercise; MRDQ = Modified Roland-Morris Disability Questionnaire; N = number; PL = profile likelihood; RDQ = Roland-Morris Disability Questionnaire; SD = standard deviation; SMD = standardized mean difference

[a] Newly included trials since the original 2020 systematic review: Michalsen 2021, Neyaz 2019 (Surveillance Report 1)

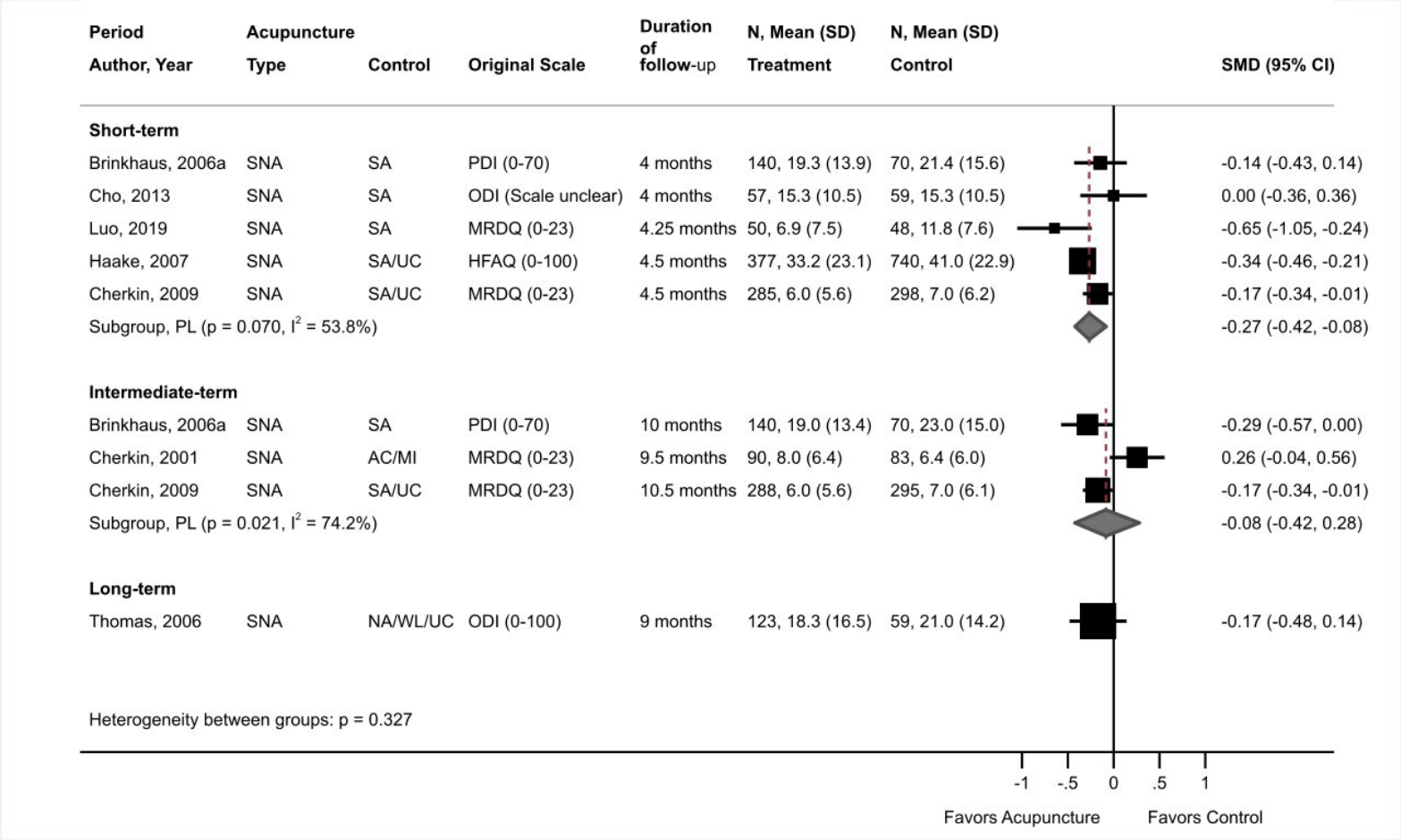
Figure G-10. Mind-body therapies versus exercise for chronic low back pain: effects on pain[a]



CI = confidence interval; CPGS=Von Korff Chronic Pain Grade Score; EXE = exercise; MRDQ = Modified Roland-Morris Disability Questionnaire; N = number; PL = profile likelihood; RDQ = Roland-Morris Disability Questionnaire; SD = standard deviation; SMD = standardized mean difference

[a] Newly included trials since the original 2020 systematic review: Michalsen 2021, Neyaz 2019 (Surveillance Report 1)

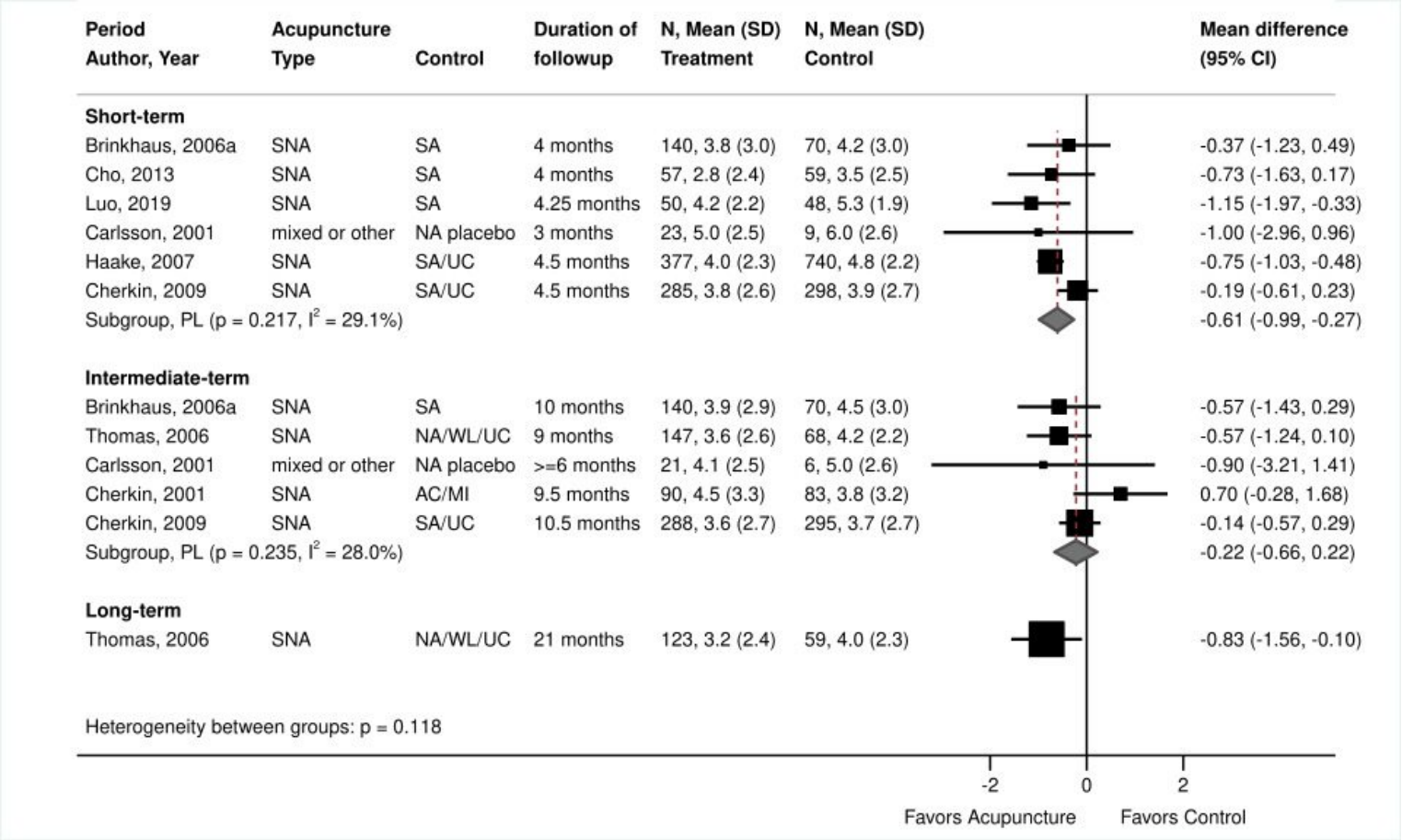
Figure G-11. Acupuncture versus sham acupuncture, usual care, an attention control, or a placebo intervention for chronic low back pain: effects on function[a]



AC = attention control; CI = confidence interval; HFAQ = Hannover Functional Ability Questionnaire; MI = minimal intervention; MRDQ = Modified Roland-Morris Disability Questionnaire; N = number; NE = no exercise; ODI = Oswestry Disability Index; PDI = Pain Disability Index; SA=sham acupuncture; SD = standard deviation; SMD = standardized mean difference; SNA =standard needle acupuncture; UC = usual care; WL = waitlist.

[a] Newly included trial since the original 2020 systematic review: Luo 2019 (Surveillance Report 1)

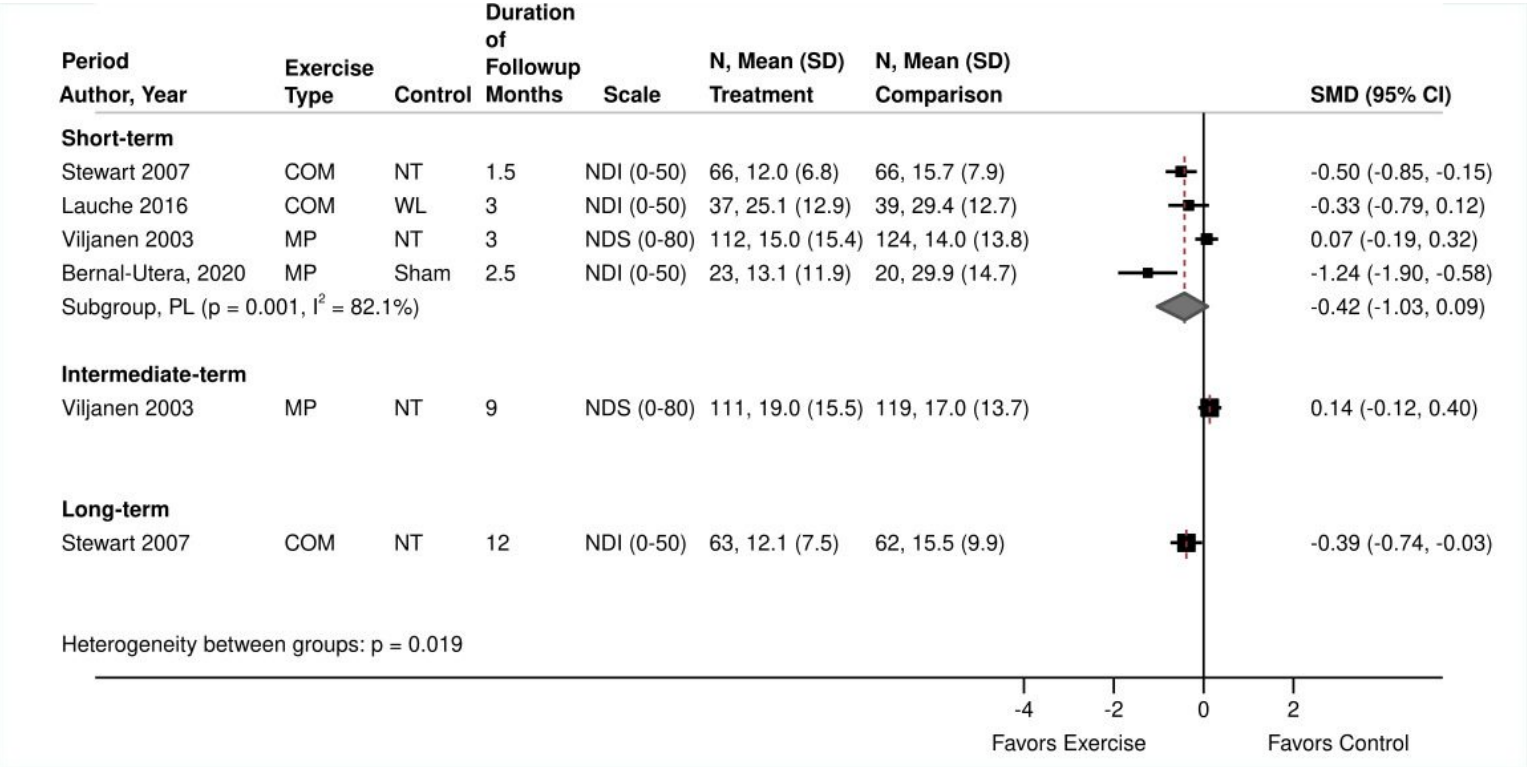
Figure G-12. Acupuncture versus sham acupuncture, usual care, an attention control, or a placebo intervention for chronic low back pain: effects on pain[a]



AC = attention control; CI = confidence interval; MI = minimal intervention; N = number; NA = needle acupuncture; PL = profile likelihood; SA=sham acupuncture; SD = standard deviation; SNA = standard needle acupuncture; UC = usual care; WL = waitlist

[a] Newly included trial since the original 2020 systematic review: Luo 2019 (Surveillance Report 1)

Figure G-13. Exercise versus no treatment, waitlist, or an attention control for chronic neck pain:[a] effects on function, excluding outlier trial[b]

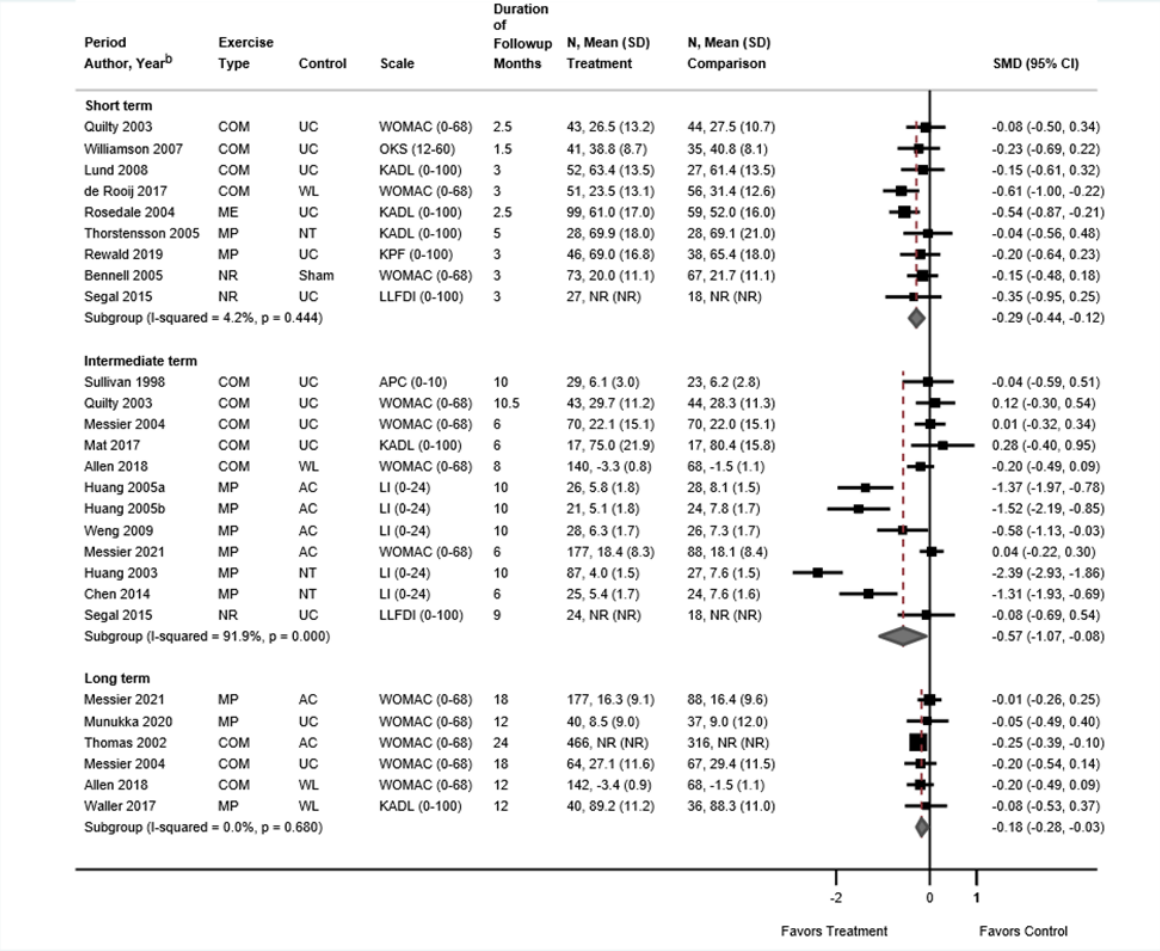


CI = confidence interval; COM = combination exercise therapy; MP = muscle performance exercise; NDI = Neck Disability Index; NDS = neck disability scale; NT = no treatment; PL = profile likelihood; SD = standard deviation; SMD = standardized mean difference; WL = waitlist.

[a] Newly included trial since the original 2020 systematic review: Bernal-Utera 2020 (Surveillance Report 1)

[b] Li 2017b, included in prior report.

Figure G-14. Exercise versus usual care, no treatment, sham, or an attention control for osteoarthritis knee pain: effects on function, excluding outlier trial[a]

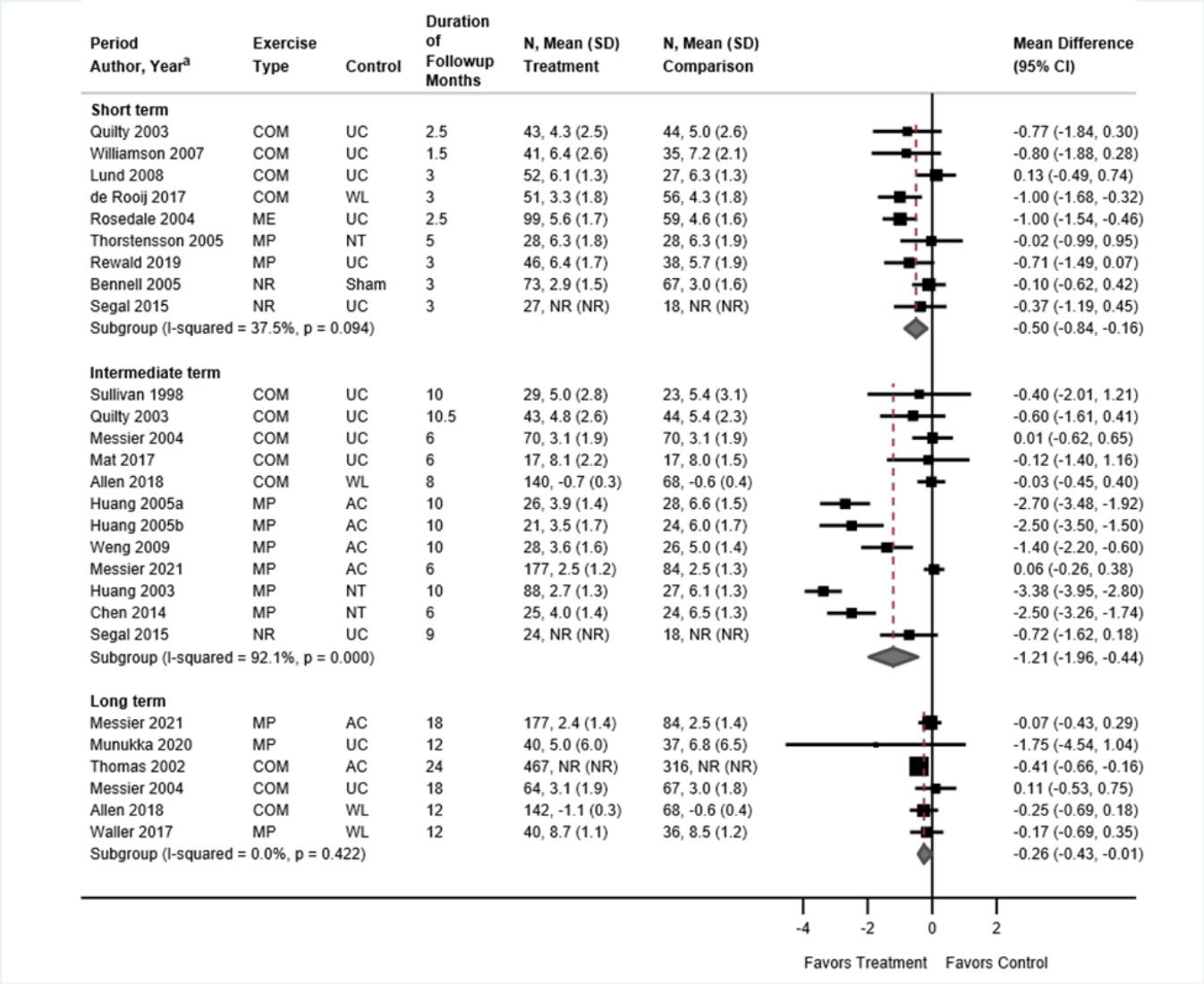


AC = attention control; APC = Arthritis Impact Measurement Scale (AIMS) physical activity component; CI = confidence interval; COM = combination exercise therapy; KADL = Knee Injury and Osteoarthritis Outcome Score (KOOS) ADL subscore; LI = Lequesne Index; LLFDI = Late Life Function and Disability Index Basic Lower Limb Function Score; ME = mobility exercise; MP = muscle performance exercise; NR = neuromuscular reeducation exercise; NR = not reported; NT = no treatment; OKS = Oxford Knee Score; SD = standard deviation; SMD = standardized mean difference; UC = usual care; WL = waitlist; WOMAC = Western Ontario and McMaster's Universities Osteoarthritis Index

[a] Dias 2003, included in prior report.

[b] Newly included trials since the original 2020 systematic review: Messier 2021, Munukka 2020 and Rewald 2019 (Surveillance Report 1).

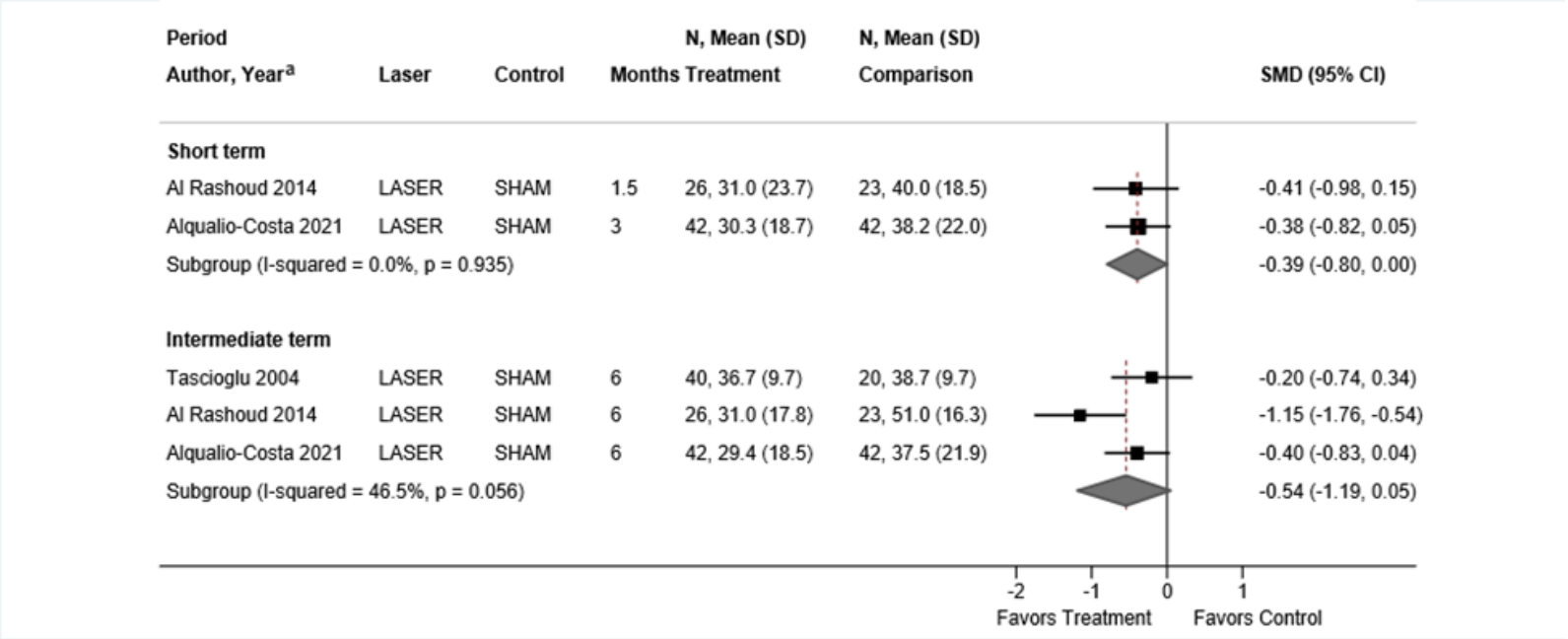
Figure G-15. Exercise versus usual care, no treatment, sham, or an attention control for osteoarthritis knee pain: effects on pain



AC = attention control; CI = confidence interval; COM = combination exercise therapy; ME = mobility exercise; MP = muscle performance exercise; NR = neuromuscular re-education exercise; NR = not reported; NT = no treatment; SD = standard deviation; UC = usual care; WL = waitlist.

[a] Newly included trials since the original 2020 systematic review: Messier 2021, Munukka 2020 and Rewald 2019 (Surveillance Report 1).

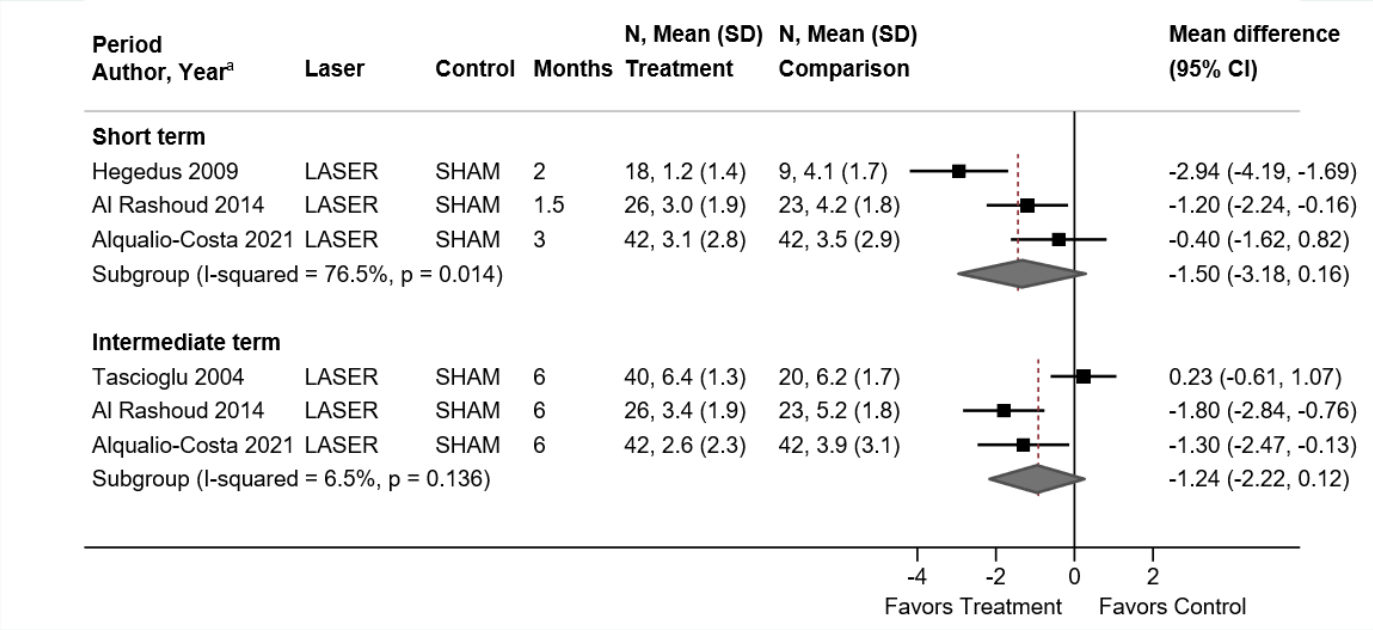
Figure G-16. Low-level laser therapy versus usual care or sham for osteoarthritis knee pain: effects on function (new meta-analysis)



CI = confidence interval; SD = standard deviation; UC = usual care

[a] Newly included trial since the original 2020 systematic review: Alqualio-Costa 2021 (Surveillance Report 1)

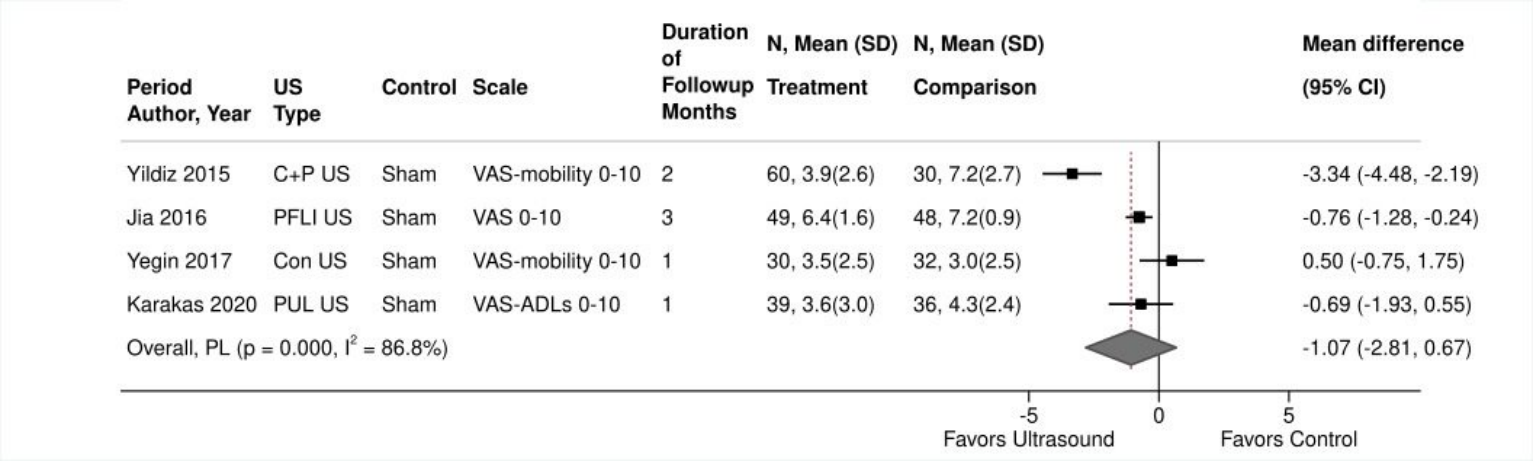
Figure G-17. Low-level laser therapy versus usual care or sham for osteoarthritis knee pain: effects on pain



CI = confidence interval; SD = standard deviation; UC = usual care

[a] Newly included trial since the original 2020 systematic review: Alqualio-Costa 2021 (Surveillance Report 1)

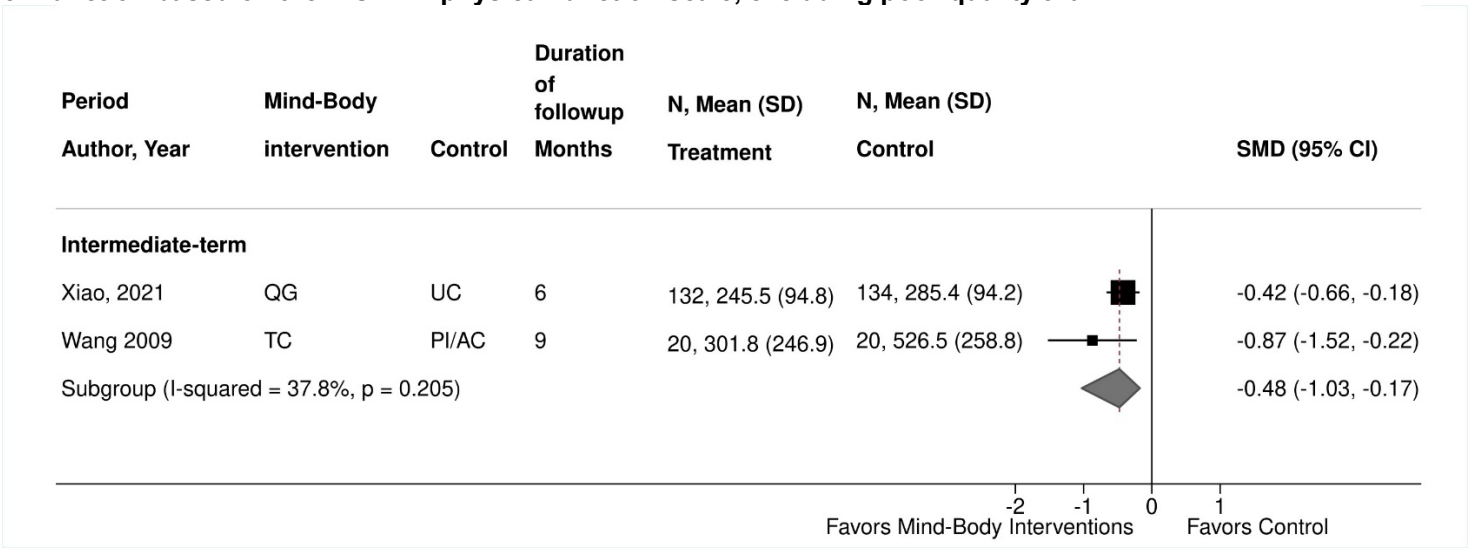
Figure G-18. Ultrasound versus sham for osteoarthritis knee pain: effects on pain short term[a]



ADL = activities of daily living; CI = confidence interval; Con US = continuous ultrasound; C+P US = continuous and pulsed ultrasound combined; N = number; PFLI US = pulsed frequency low intensity ultrasound; PL = profile likelihood; SD = standard deviation; VAS = visual analog scale.

[a] Newly included trial since the original 2020 systematic review: Karakas 2020 (Surveillance Report 1)

Figure G-19. Mind-body therapies versus usual care, an attention control, or a placebo intervention for osteoarthritis knee pain:[a] effects on function based on the WOMAC physical function scale, excluding poor-quality trial[b]

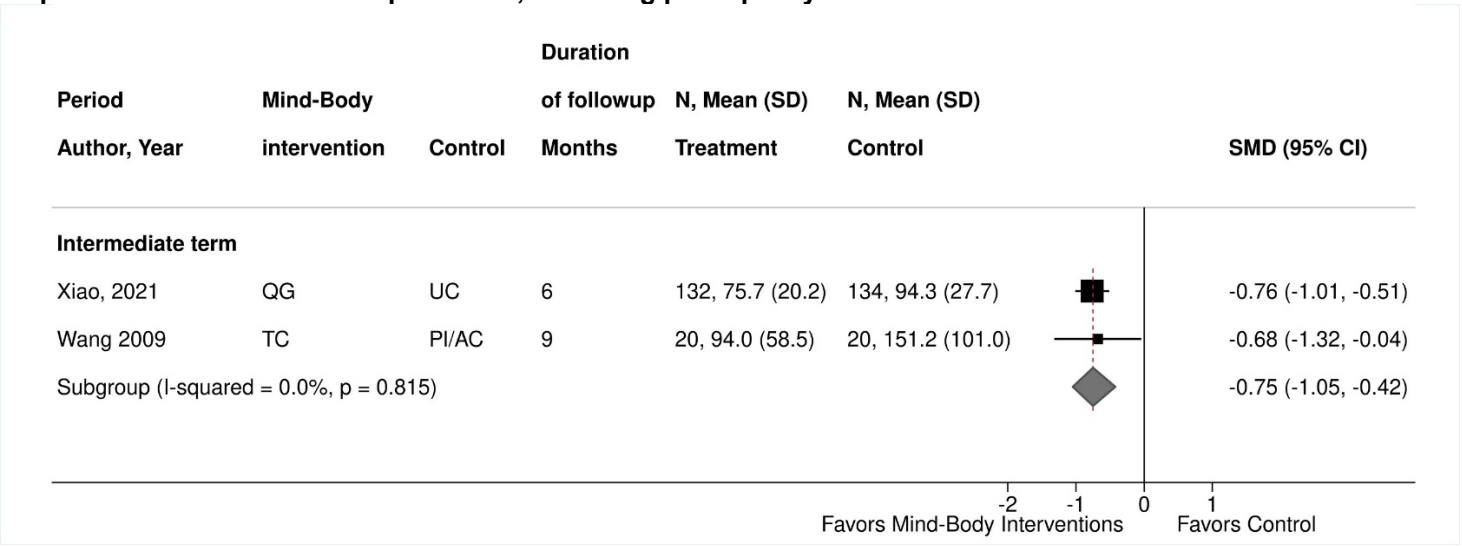


AC = attention control; CI = confidence interval; PI = placebo intervention; QG = qigong; SD = standard deviation; SMD = standardized mean difference; TC = tai chi; UC = usual care; WOMAC = Western Ontario and McMaster University Osteoarthritis Index.

[a] Newly included trials since the original 2020 systematic review: Hu 2020 (Surveillance Report 1), Xiao 2021 (Surveillance Report 3)

[b] Hu 2020, identified in Surveillance Report 1. Including Hu 2020: 3 RCT, n=398, pooled SMD –0.92 (95% CI –1.74 to –0.15), I^2 = 80.2%.

Figure G-20. Mind-body therapies versus usual care, an attention control, or a placebo intervention for osteoarthritis knee pain:[a] effects on pain based on the WOMAC pain scale, excluding poor-quality trial[b]

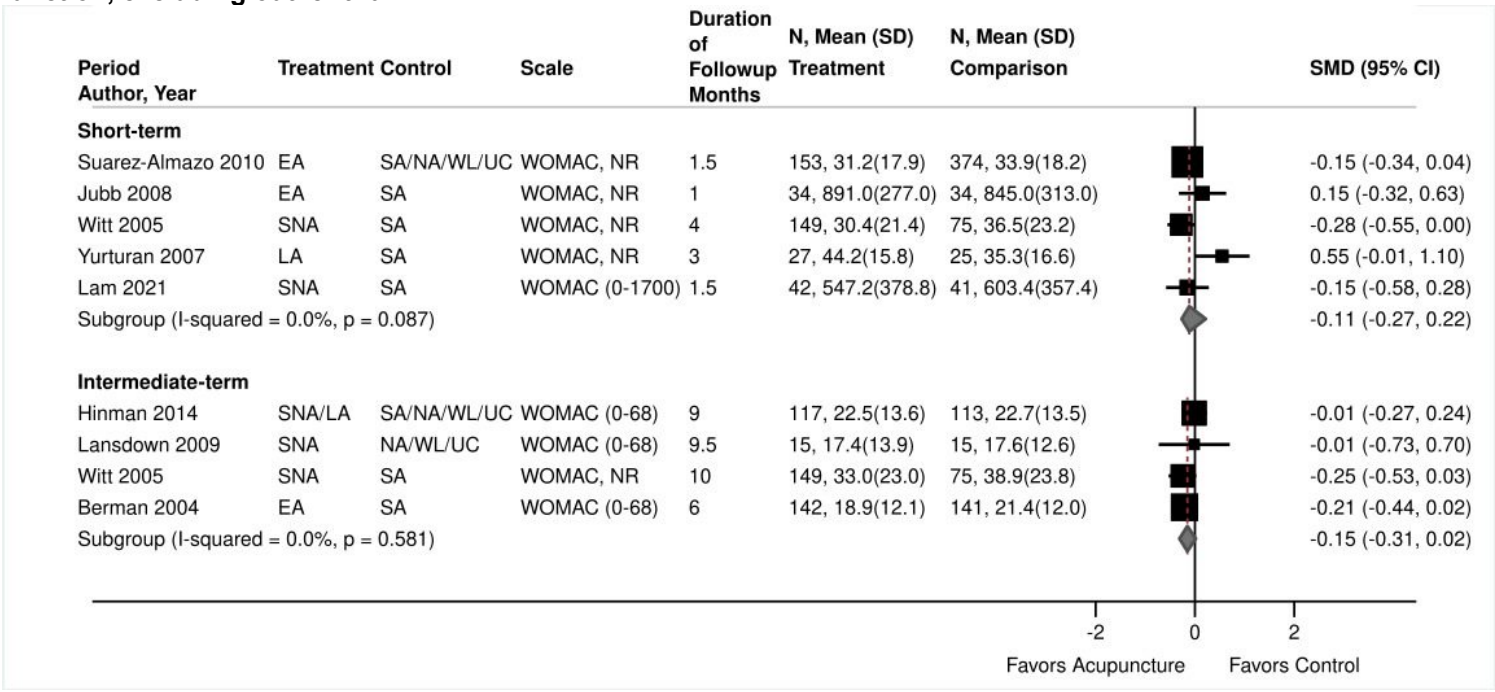


AC = attention control; CI = confidence interval; PI = placebo intervention; QG = qigong; SD = standard deviation; SMD = standardized mean difference; TC = tai chi; UC = usual care; WOMAC = Western Ontario and McMaster University Osteoarthritis Index.

[a] Newly included trials since the original 2020 systematic review: Hu 2020 (Surveillance Report 1), Xiao 2021 (Surveillance Report 3)

[b] Hu 2020, identified in Surveillance Report 1. Including Hu 2020: 3 RCT, n=398, SMD –0.83 (95% CI –1.16 to –0.57), I^2 = 0.0%.

Figure G-21. Acupuncture versus usual care, an attention control, or a placebo intervention for osteoarthritis knee pain:[a] effects on function, excluding outlier trial[b]

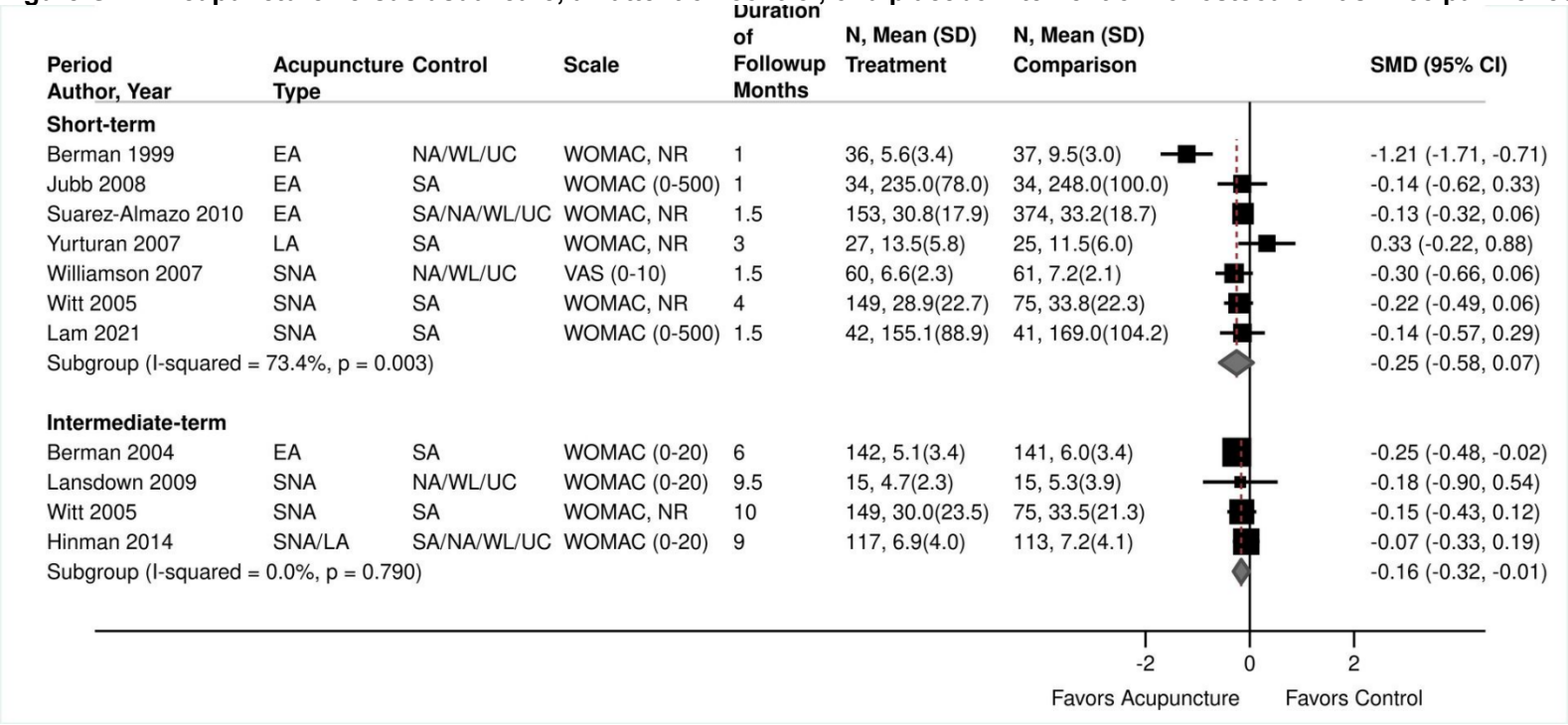


EA = electroacupuncture; LA = laser acupuncture; NR = not reported; SA = sham acupuncture; SNA = standard needle acupuncture; SD = standard deviation; SMD = standardized mean difference; NR = not reported; UC = usual care; WL = waitlist; WOMAC = Western Ontario and McMaster's Universities Osteoarthritis Index

[a] Newly included trial since the original 2020 systematic review: Lam 2021 (Surveillance Report 1)

[b] Berman 1999 at short-term followup, including in prior report

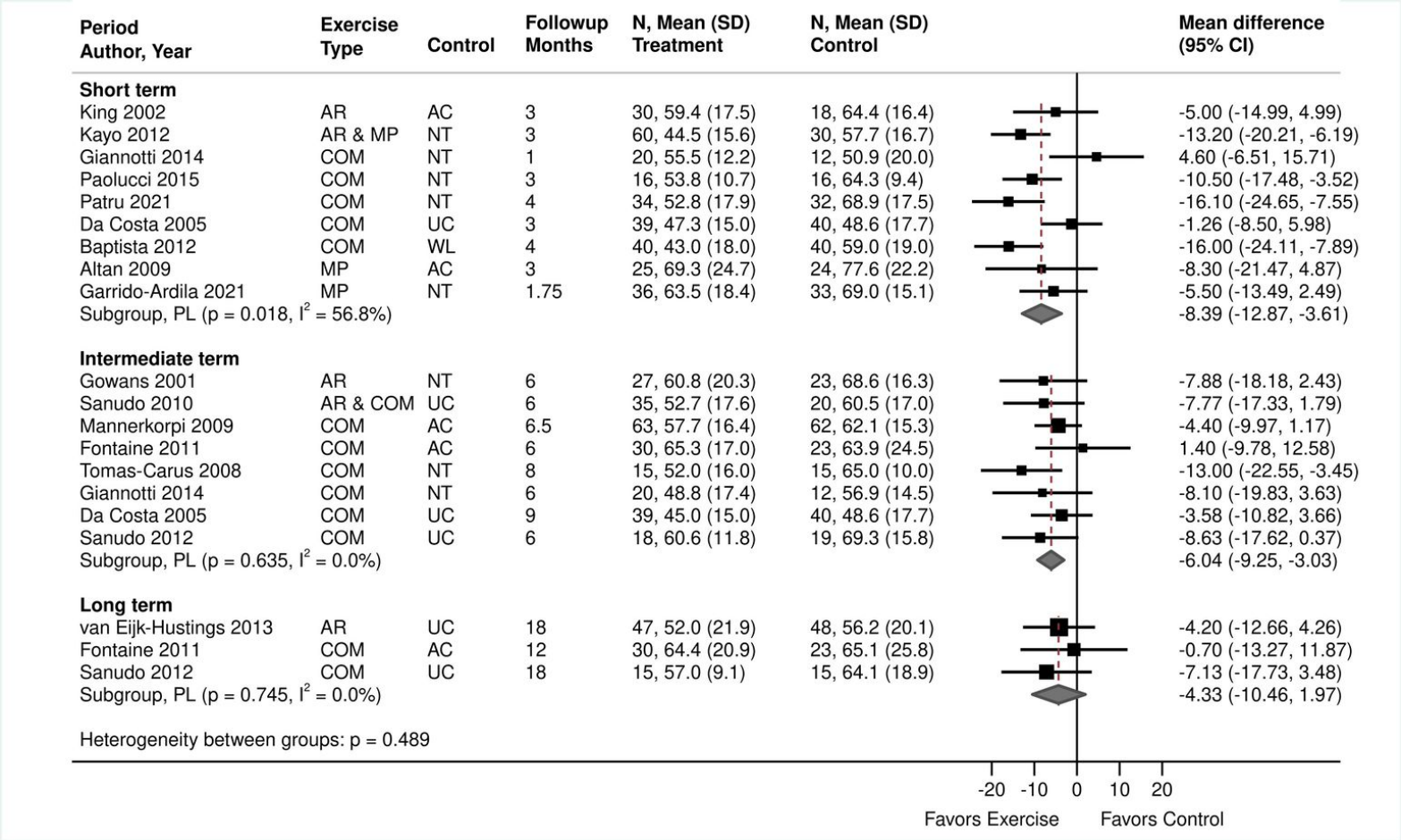
Figure G-22. Acupuncture versus usual care, an attention control, or a placebo intervention for osteoarthritis knee pain: effects on pain[a]



EA = electroacupucnture; LA = laser acupuncture; NR = not reported; SA = sham acupuncture; SNA = standard needle acupuncture; SD = standard deviation; SMD = standardized mean difference; NR = not reported; UC = usual care; VAS = visual analog scale; WL = waitlist; WOMAC = Western Ontario and McMaster's Universities Osteoarthritis Index

[a] Newly included trial since the original 2020 systematic review: Lam 2021 (Surveillance Report 1)

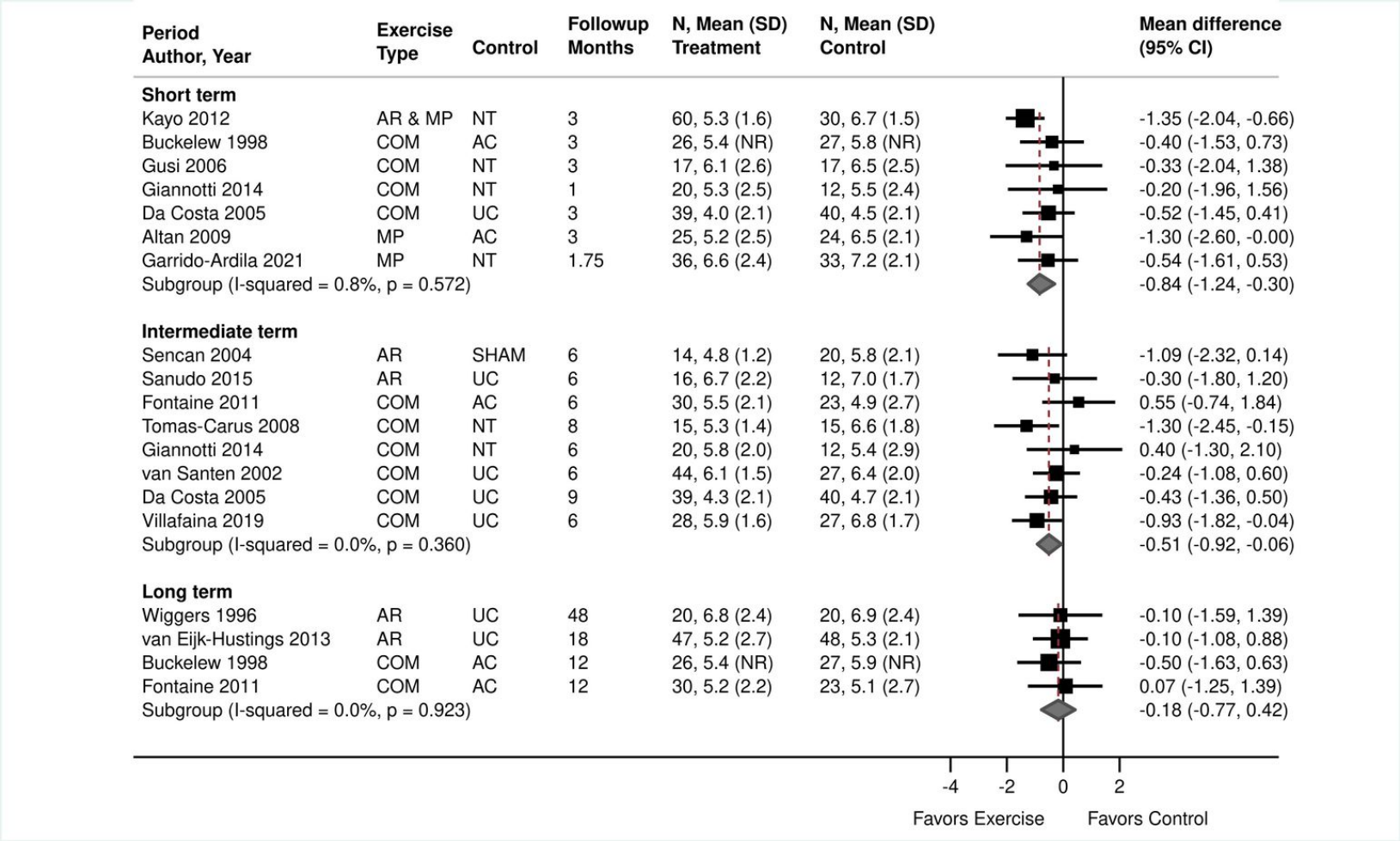
Figure G-23. Exercise versus usual care, an attention control, or a placebo intervention for fibromyalgia: effects on function (FIQ Total)[a]



AC = attention control; AR = aerobic exercise; AR & COM = aerobic exercise in one arm and combination exercise in another arm; AR & MP = aerobic exercise in one arm and muscle performance exercise in another arm; CI = confidence interval; COM = combination exercise therapy; FIQ = Fibromyalgia Impact Questionnaire; MP = muscle performance exercise; NT = no treatment; PL = profile likelihood; SD = standard deviation; UC = usual care; WL = waitlist.

[a] Newly included trials since the original 2020 systematic review: Patru 2021 (Surveillance Report 1) and Garrido-Ardila 2021 (Surveillance Report 3)

Figure G-24. Exercise versus usual care, an attention control, or a placebo intervention for fibromyalgia:[a] effects on pain, excluding outlier trial[b]

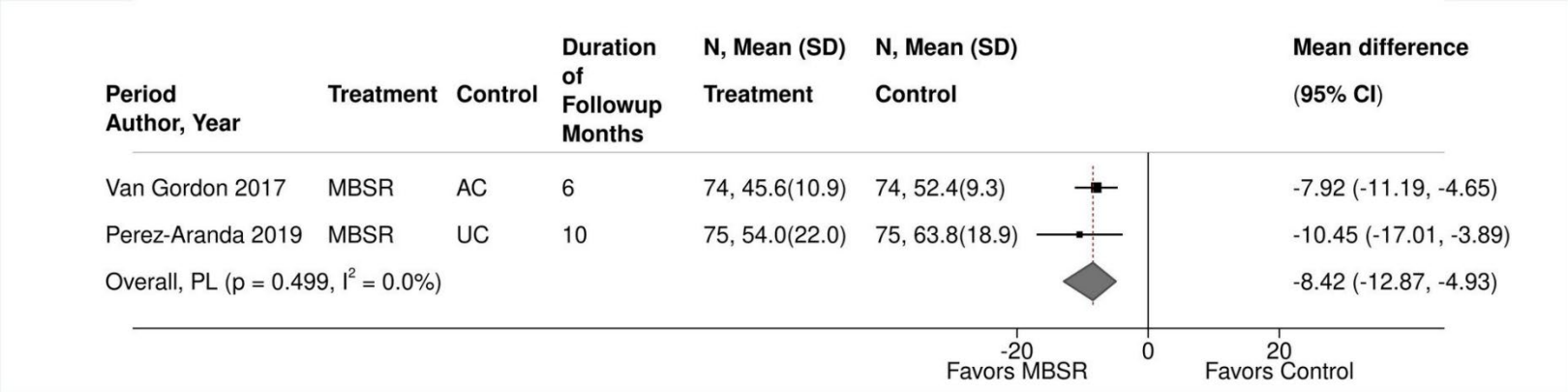


AC = attention control; AR = aerobic exercise; AR & MP = aerobic exercise in one arm and muscle performance exercise in another arm; CI = confidence interval; COM = combination exercise therapy; MP = muscle performance exercise; NT = no treatment; SD = standard deviation; UC = usual care.

[a] Newly included trial since the original 2020 systematic review: Garrido-Ardila 2021 (Surveillance Report 3)

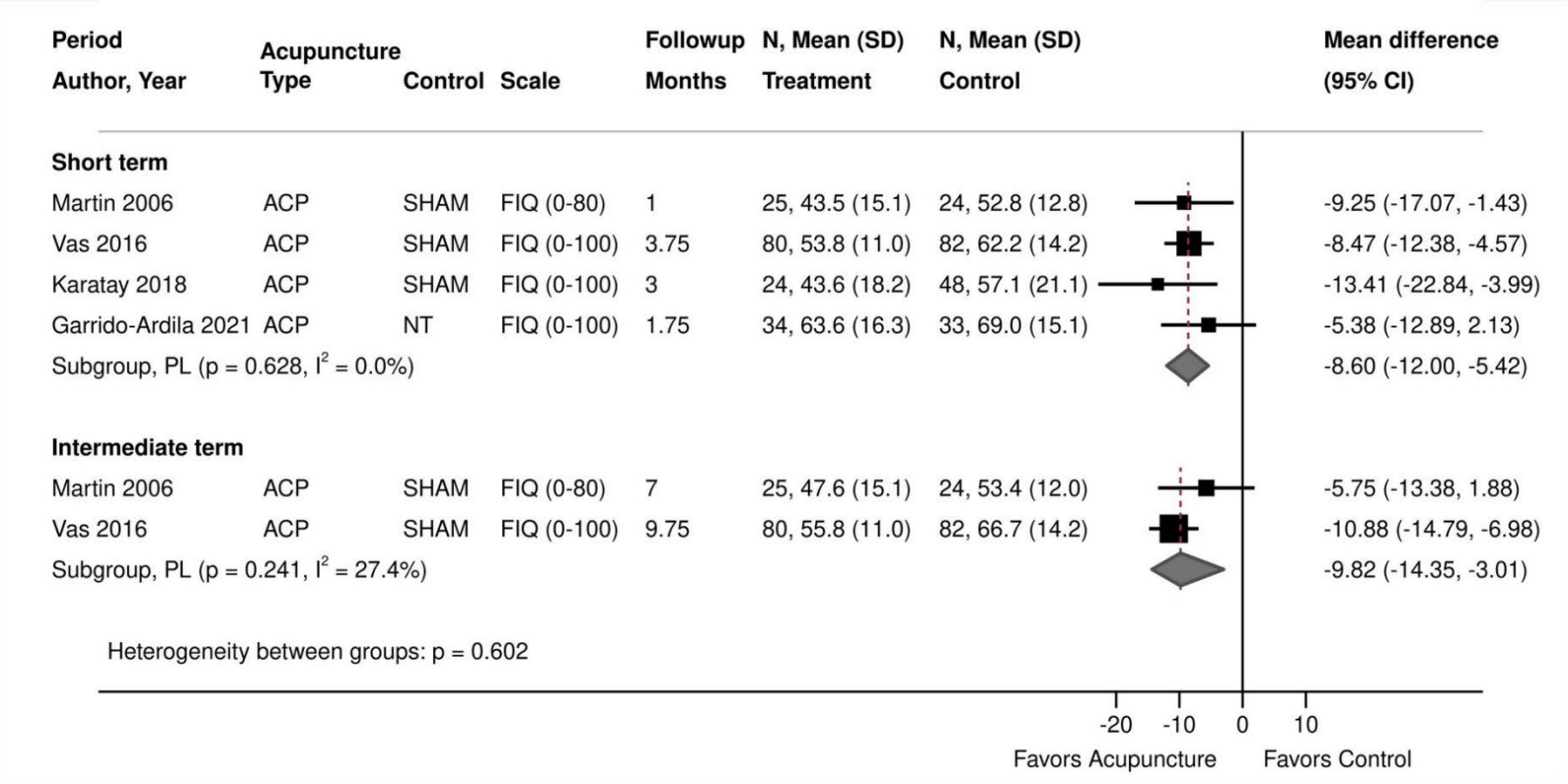
[b] Baptista 2012, included in prior report

Figure G-25. Mindfulness practices versus usual care or an attention control for fibromyalgia: effects on function (FIQ Total) intermediate term (new meta-analysis)[a]



AC = attention control; FIQ = Fibromyalgia Impact Questionnaire; MBSR = mindfulness-based stress reduction; PL = profile liklihood; SD = standard deviation; UC = usual care.
[a] Newly included trial since the original 2020 systematic review: Perez-Aranda 2019 (Surveillance Report 1)

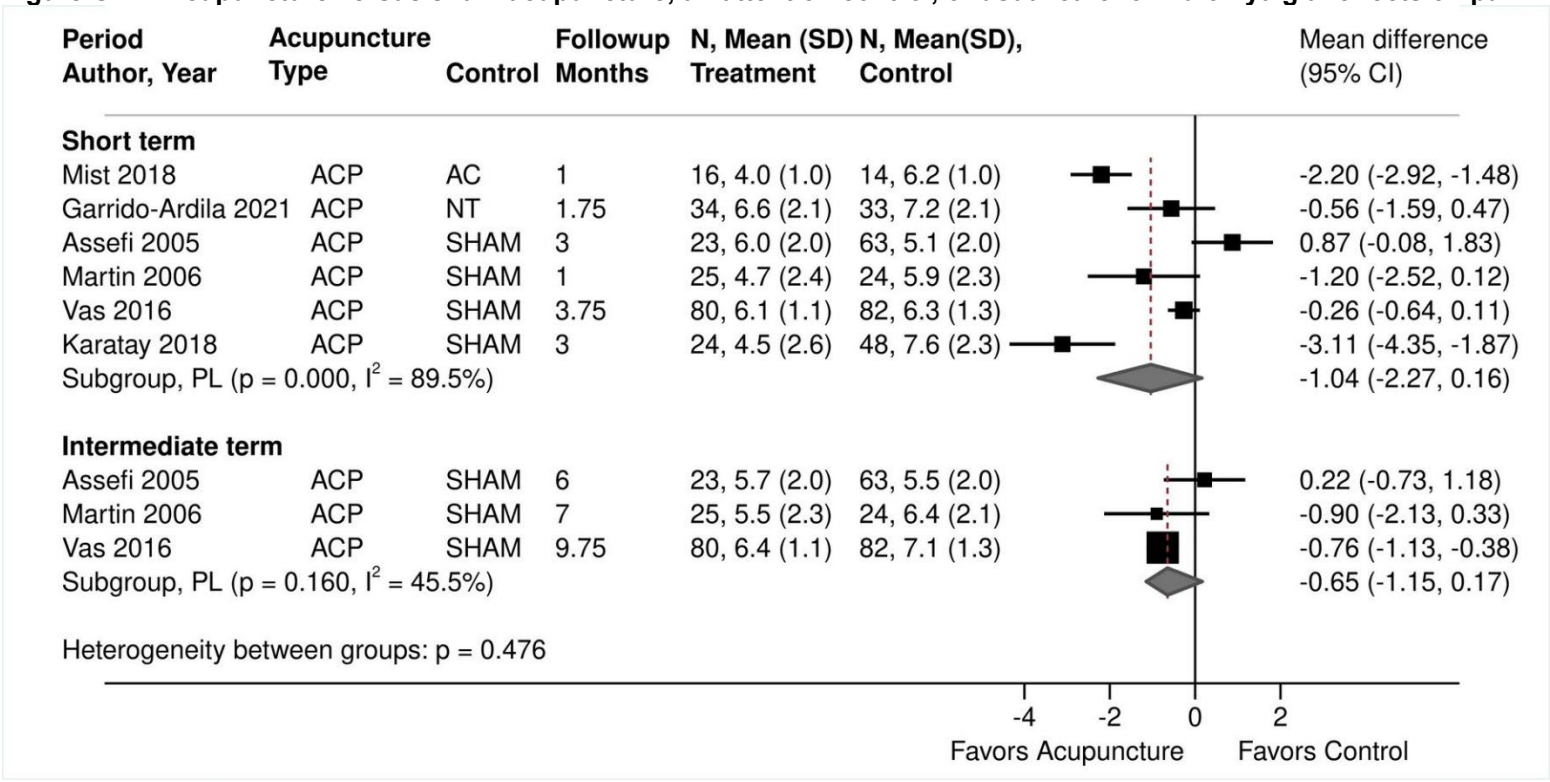
Figure G-26. Acupuncture versus sham acupuncture or usual care for fibromyalgia: effects on function[a]



ACP = acupuncture; CI = confidence interval; FIQ = Fibromyalgia Impact Questionnaire; NT = no treatment/usual care; PL = profile likelihood; SD = standard deviation

[a] Newly included trial since the original 2020 systematic review: Garrido-Ardila 2021 (Surveillance Report 3)

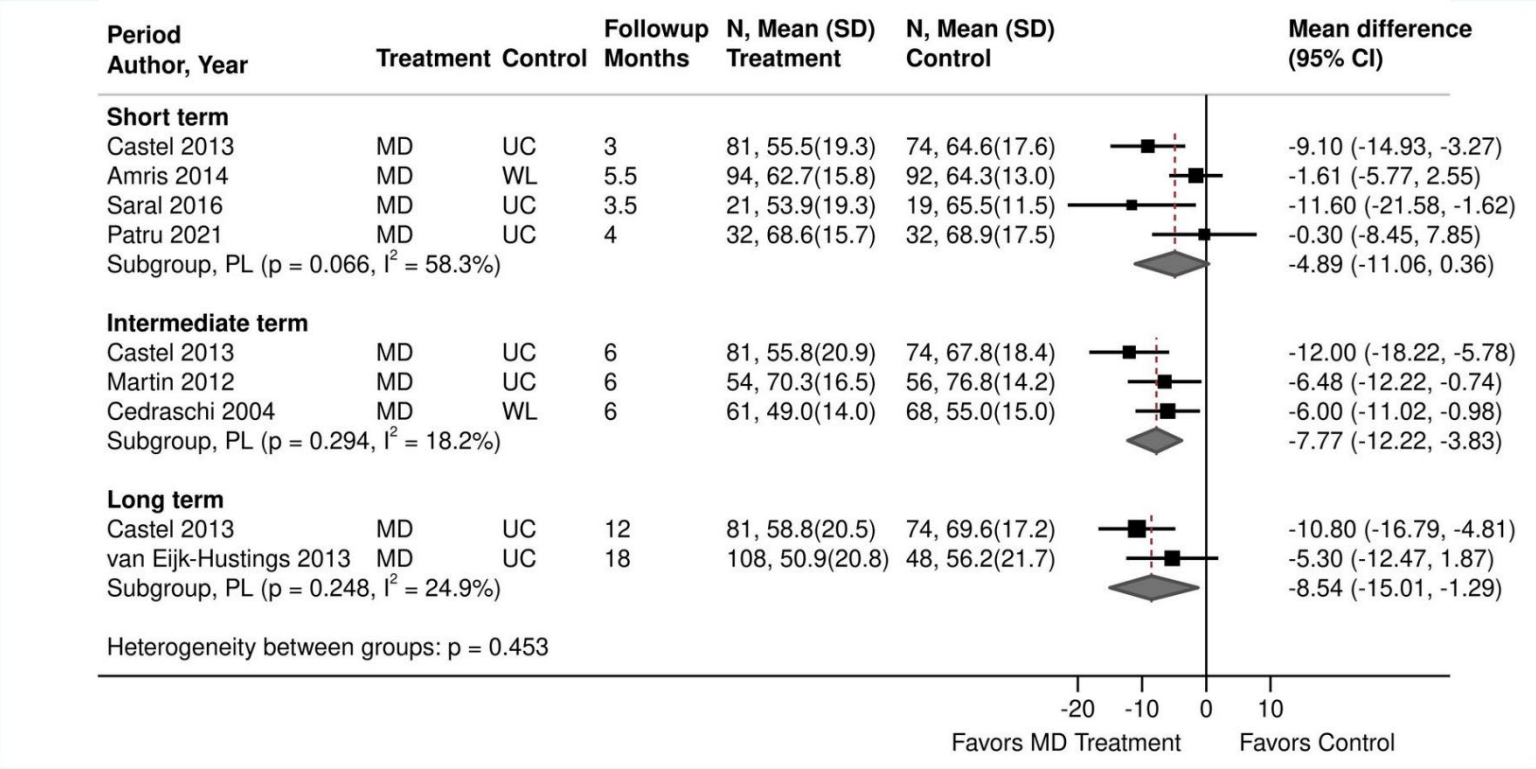
Figure G-27. Acupuncture versus sham acupuncture, an attention control, or usual care for fibromyalgia: effects on pain[a]



AC = attention control; ACP = acupuncture; CI = confidence interval; NT = no treatment/usual care; PL = profile likelihood; SD = standard deviation

[a] Newly included trial since the original 2020 systematic review: Garrido-Ardila 2021 (Surveillance Report 3)

Figure G-28. Multidisciplinary rehabilitation versus sham acupuncture, an attention control, or usual care for fibromyalgia: effects on function[a]



CI = confidence interval; MD = multidisciplinary rehabilitation; PL = profile likelihood; SD = standard deviation; UC = usual care; WL = waitlist

[a] Newly included trials since the original 2020 systematic review: Patru 2021 (Surveillance Report 1)

Appendix H. Strength of Evidence Tables

All outcomes were considered direct; therefore, the Directness domain is not shown on the strength of evidence tables.
See Appendix C, Included Studies, for references.

Table H-1. Low back pain (KQ 1) strength of evidence

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction, and Magnitude of Effect
Exercise	*Exercise vs. usual care, attention control, or a placebo intervention*	Function *Short-term*	13 (N=1,126) Bramberg 2017[a] Costa 2009 Garcia 2018[a] Goldby 2006 Kankaanpaa 1999 Lang 2021 (new) Mazloum 2017[a] Miyamoto 2013 Miyamoto 2018[a] Nassif 2011 Natour 2014 Shariat 2019 (new) Yang 2021 (new)	Moderate	Consistent	Precise	Undetected	Moderate (upgraded 1 level from prior report)	Pooled SMD –0.33 (95% CI –0.51 to –0.16); I^2=38.6% (excluding an outlier trial)[b]

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction, and Magnitude of Effect
	Exercise vs. usual care, attention control, or a placebo intervention	Function *Intermediate -term*	6 (N=712) Costa 2009 Garcia 2018[a] Goldby 2006 Kankaanpaa 1999 Lang 2021 (new) Miyamoto 2018[a]	Moderate	Consistent	Imprecise	Undetected	Low	Pooled SMD –0.20 (95% CI –0.41 to –0.03); I^2=0%
	Exercise vs. usual care, attention control, or a placebo intervention	Pain *Short-term*	13 (N=1,131) Areeudomwong, 2017[a] Bramberg 2017[a] Costa 2009 Garcia 2018[a] Goldby 2006 Kankaanpaa 1999 Lang 2021 (new) Mazloum 2017[a] Miyamoto 2013 Nassif 2011 Natour 2014 Miyamoto, 2018[a] Yang 2021 (new)	Moderate	Inconsistent	Precise	Undetected	Low (downgraded 1 level from prior report)	Pooled difference –1.05 (95% CI –1.58 to –0.51) on a 0 to 10 scale; I^2=65.8%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction, and Magnitude of Effect
	Exercise vs. usual care, attention control, or a placebo intervention	Pain *Intermediate-term*	6 (N=712) Costa 2009 Garcia 2018[a] Goldby 2006 Kankaanpaa 1999 Lang 2021 (new) Miyamoto 2018 [a]	Moderate	Consistent	Imprecise	Undetected	Low	Pooled difference –0.84 (95% CI –1.49 to –0.22) on a 0 to 10 scale; I^2=38.9%
	Exercise vs. usual care, attention control, or a placebo intervention	Harms	3 (N=336) Costa 2009 Lang 2021 (new) Miyamoto 2013	Moderate	Consistent	Imprecise	Undetected	Low	No evidence of increased risk of serious harms
Psychological Therapy	*Psychological therapy vs. usual care or attention control*	Function *Short-term*	4 (N=1,018) Ashar 2021 (new) Cherkin 2016 Lamb 2010/2012 Poole 2007	Moderate	Consistent[b]	Precise	Undetected	Moderate	Pooled SMD –0.34 (95% CI –0.74 to 0.02); I^2=71% (excluding an outlier trial)[b]
	Psychological therapy vs. usual care or attention control	Function *Intermediate-term*	4 (N=1,142) Ashar 2021 (new) Cherkin 2016/2017 Johnson 2007 Lamb 2010/2012	Moderate	Consistent	Precise	Undetected	Moderate	Pooled SMD –0.30 (95% CI –0.60 to –0.11); I^2=0%
	Psychological therapy vs. usual care or attention control	Function *Long-term*	4 (N=939) Ashar 2021 (new) Cherkin 2017 Johnson 2007 Lamb 2010/2012	Moderate	Consistent	Precise	Undetected	Moderate	Pooled SMD –0.31 (95% CI –0.47 to –0.18); I^2=0%
	Psychological therapy vs. usual care or attention control	Pain *Short-term*	5 (N=1,048) Ashar 2021 (new) Cherkin 2016 Lamb 2010/2012 Poole 2007 Soleymani 2021	Moderate	Consistent	Precise	Undetected	Moderate	Pooled difference –0.76 (95% CI –1.22 to –0.36) on a 0 to 10 scale; I^2=57%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction, and Magnitude of Effect
	Psychological therapy vs. usual care or attention control	Pain *Intermediate -term*	4 (N=1,142) Ashar 2021 (new) Cherkin 2016 Johnson 2007 Lamb 2010/2012	Moderate	Consistent	Precise	Undetected	Moderate	Pooled difference –0.79 (95% CI –1.19 to –0.55); I^2=0%
	Psychological therapy vs. usual care or attention control	Pain *Long-term*	4 (N=940) Ashar 2021 (new) Cherkin 2016/2017 Johnson 2007 Lamb 2010/2012	Moderate	Consistent	Precise	Undetected	Moderate	Pooled difference –0.76 (95% CI –1.27 to –0.31); I^2=38%
	Psychological therapy vs. exercise	Function *Short-term*	1 (N=36) Shariat 2019 (new)	Moderate	Unknown	Imprecise	Undetected	Insufficient	Insufficient evidence from 1 small trial
	Psychological therapy vs. *usual care, attention control, or exercise*	Harms	2 (N=825) Ashar 2021 (new) Lamb 2010/2012	Moderate	Unknown	Imprecise	Undetected	Low	Two trials reported no serious adverse events and one trial reported withdrawal due to adverse events in <1% of patients randomized to psychological therapy
Physical Modalities	*Low-level laser therapy vs. sham laser*	Function *Short-term*	2 (N=90) Basford 1999 Kholoosy 2020 (new)	Moderate	Unknown[c]	Precise	Undetected	Low[c]	Difference –8.2 (95% CI –13.6 to –2.8) on the 0 to 100 ODI [fair-quality trial] Difference –5.7 (95% CI –8.5 to –2.9) on the 0 to 24 RDQ [poor-quality trial]
	Low-level laser therapy vs. sham laser	Pain *Short-term*	2 (N=90) Basford 1999 Kholoosy 2020 (new)	Moderate	Unknown[c]	Imprecise	Undetected	Low[c]	Difference –1.60 (95% CI –2.83 to –0.37) on a 0 to 10 scale [fair-quality trial] Difference –4.40 (95% CI –5.31 to –3.49) on a 0 to 10 scale [poor-quality trial]

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction, and Magnitude of Effect
	Low-level laser therapy vs. sham laser	Harms	4 (N=196) Djavid 2007 Basford 1999 Kholoosy 2020 (new) Soriano 1998	Moderate	Consistent	Imprecise	Undetected	Low	No adverse events were reported in 3 trials (2 fair, 1 poor quality). One small poor-quality trial reported a temporary increase in pain in 50% of patients following the first session of true LLLT; all other events occurred in the sham laser group (likely due to concomitant use of naproxen per the authors).
Physical Modalities	*TENS vs. sham*	Function *Short-term*	1 (N=73) Yaksi 2021 (new)	Moderate	Unknown	Imprecise	Undetected	Low	Burst vs. sham TENS: difference –2.90 on the 0 to 50 mODI scale (95% CI –7.97 to 2.17); Conventional vs. sham TENS: difference –2.30 on the 0 to 50 mODI scale (95% CI –7.77 to 3.17)
	TENS vs. sham	Pain *Short-term*	1 (N=73) Yaksi 2021 (new)	Moderate	Unknown	Imprecise	Undetected	Low	Burst vs. sham TENS: difference –0.80 on a 0 to 10 scale (95% CI –2.24 to 0.64); Conventional vs. sham TENS: difference –1.30 on a 0 to 10 scale (95% CI –2.74 to 0.14)
	TENS vs. sham	Harms	1 (N=73) Yaksi 2021 (new)	Moderate	Unknown	Imprecise	Undetected	Low	No TENS-associated side effects occurred in any patient.
Manual Therapies	*Massage vs. sham massage, usual care, or attention control*	Function *Short-term*	7 (N=753) Ajimsha 2014 Arguisuelas 2017[d] Cherkin 2011 Kobayashi 2019 (new) Movahedi 2017[d] Poole 2007 Quinn 2008	Moderate	Consistent	Precise	Undetected	Moderate	Pooled SMD –0.40 (95% CI –0.62 to –0.24); I^2=0%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction, and Magnitude of Effect
	Massage vs. sham massage, usual care, or attention control	Pain *Short-term*	6 (N=703) Ajimsha 2014 Arguisuelas 2017[d] Cherkin 2011 Kobayashi 2019 (new) Poole 2007 Quinn 2008	Moderate	Consistent	Precise	Undetected	Moderate	Pooled difference –0.58 (95% CI –0.93 to –0.29) on a 0 to 10 scale; I^2=0%
	Massage vs. sham, usual care, attention control, or exercise	Harms	8 (N=965) Ajimsha 2014 Arguisuelas 2017[d] Cherkin 2001 Cherkin 2011 Kobayashi 2019 (new) Little 2008 Movahedi 2017[d] Quinn 2008	Moderate	Consistent	Imprecise	Undetected	Low	Four trials reported no serious adverse events, and one trial reported no adverse events; in five trials the proportion of massage patients with increased pain ranged from <1% to 26%, and in one trial 3% complained of headache.
Manual Therapies	*Spinal manipulation vs. sham manipulation, usual care, attention control, or placebo intervention*	Function *Short-term*	4 (N=857) Haas 2014 Hondras 2009 Senna 2011 Thomas 2020 (new)	Moderate	Inconsistent	Precise	Undetected	Low	Pooled SMD –0.24 (95% CI –0.62 to 0.09); I^2=61.9%
	Spinal manipulation vs. sham manipulation, usual care, attention control, or placebo intervention	Pain *Short-term*	4 (N=683) Gibson 1985 Haas 2014 Senna 2011 Thomas 2020 (new)	Moderate	Consistent	Imprecise	Undetected	Low	Pooled difference –0.32 (95% CI –0.55 to 0.10) on a 0 to 10 scale; I^2=0%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction, and Magnitude of Effect
Mind-Body Practices	*Yoga vs. exercise*	Function *Short-term*	6 (N=811) Bramberg 2017[e] Michalsen 2021 (new) Neyaz 2019 (new) Saper 2017 Sherman 2005 Sherman 2011	Moderate	Consistent	Imprecise	Undetected	Low	Pooled SMD –0.01 (95% CI –0.16 to 0.13); I^2=0%
	Yoga vs. exercise	Pain *Short-term*	7 (N=827) Bramberg, 2017[e] Michalsen 2021 (new) Nambi 2014 Neyaz 2019 (new) Saper 2017 Sherman 2005 Sherman 2011	Moderate	Inconsistent	Imprecise	Undetected	Low	Pooled difference –0.88 (95% CI –1.88 to 0.16) on a 0 to 10 scale; I^2=95%
	Yoga vs. exercise	Harms	3 (N=868) Michalsen 2021 (new) Neyaz 2019 (new) Saper 2017 Sherman 2011 Tilbrook 2011	Moderate	Consistent	Imprecise	Undetected	Low	No difference in risk of any adverse event (primarily mild back or joint pain) in three trials; one trial reported fewer mild events (back, general, and muscle pain) following yoga (0% to 7%) vs. exercise (8% to 30%). Three serious adverse events in yoga patients were reported by one trial each: worsening back pain related to yoga, herniated disc, and cellulitis (≤1% of patients in each trial)
Acupuncture	*Acupuncture vs. sham acupuncture, usual care, attention control, or a placebo intervention*	Function *Short-term*	5 (N=2,164) Brinkhaus 2006a Cherkin 2009 Cho 2013 Haake 2007 Luo 2019[f] (new)	Moderate	Inconsistent	Precise	Undetected	Low	Pooled SMD –0.27 (95% CI –0.42 to –0.08); I^2=53.8%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction, and Magnitude of Effect
	Acupuncture vs. sham acupuncture, usual care, attention control, or a placebo intervention	Pain *Short-term*	6 (N=2,207) Brinkhaus 2006a Carlsson 2001 Cherkin 2009 Cho 2013 Haake 2007 Luo 2019[f] (new)	Moderate	Consistent	Precise	Undetected	Moderate	Pooled difference –0.61 (95% CI –0.99 to –0.27) on a 0 to 10 scale; I^2=29.1%
	Acupuncture vs. sham acupuncture, usual care, attention control, or a placebo intervention	Harms	7 (N=2,677) Brinkhaus 2006a Cherkin 2001 Cherkin 2009 Cho 2013 Haake 2007 Luo 2019 (new) Thomas 2006	Moderate	Consistent	Imprecise	Undetected	Low	No evidence of increased risk of serious harms

CI = confidence interval; KQ = Key Question; ODI = Oswestry Disability Index; RCT = randomized controlled trial; RDQ = Roland Morris Disability Questionnaire; RR = risk ratio; SMD = standardized mean difference.

[a] New Exercise trial

[b] Outlier trial exclude, Areeudomwong, 2017

[c] Based on the fair (better) quality trial, Basford 1999

[d] New Manual therapies – massage trial

[e] New Mind Body Practice – yoga trial

[f] Standard acupuncture arm only for consistency with the other trials (this trial also had a hand-ear acupuncture arm that was also associated with greater improvement in function and pain compared with usual care)

Table H-2. Neck pain (KQ 2) strength of evidence

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
Exercise	*Exercise vs. attention control, no treatment or waitlist*	Function *Short-term*	4 (N=487) Bernal-Utera 2020 (new) Stewart 2007 Lauche 2016 Viljanen 2003	Moderate	Inconsistent[a]	Imprecise	Undetected	Low	Pooled SMD –0.42 (95% CI –1.03 to 0.09), I^2=82.1% [excluding outlier trial][a] Combination exercise only (2 trials), pooled SMD –0.44 (95% CI –0.76 to –0.09) Muscle performance exercise only (3 trials), pooled SMD –1.11 (95% CI –2.66 to 0.41)
	Exercise vs. attention control, no treatment or waitlist	Pain *Short-term*	3 (N=444) Stewart 2007 Lauche 2016 Viljanen 2003	Moderate	Inconsistent[b]	Imprecise	Undetected	Low	Pooled difference –0.70, (95% CI –1.62 to 0.15) on a 0 to 10 scale, I^2=63.7% [excluding 2 outlier trials][b]; Combination exercise only (2 trials), pooled difference –1.12 on a 0 to 10 scale (95% CI –1.82 to –0.43); Muscle performance exercise only (3 trials), pooled difference –1.82 on a 0 to 10 scale, (95% CI –3.82 to 0.24)
Manual Therapies	*Spinal Manipulation vs. sham*	Function *Short-term*	1 (N=42) Bernal-Utera 2020 (new)	Moderate	Unknown	Imprecise	Undetected	Low	Difference –18.67 (95% CI –26.04 to –11.30) on the 0 to 100 NDI
	Spinal Manipulation vs. sham	Pain *Short-term*	1 (N=42) Bernal-Utera 2020 (new)	Moderate	Unknown	Imprecise	Undetected	Low	Difference –3.05 (95% CI –3.30 to –2.80) on a 0 to 10 scale
	Spinal Manipulation vs. Exercise	Function *Short-term*	1 (N=45) Bernal-Utera 2020 (new)	Moderate	Unknown	Imprecise	Undetected	Low	Difference –1.86 (95% CI –8.10 to 4.38) on the 0 to 100 NDI
	Spinal Manipulation vs. Exercise	Pain *Short-term*	1 (N=45) Bernal-Utera 2020 (new)	Moderate	Unknown	Imprecise	Undetected	Low	Adjusted difference NR, p=1.000

CI = confidence interval; KQ = Key Question; NDI = Neck Disability Index; NRS = Numerical Rating Scale; RCT = randomized controlled trial; RR = risk ratio; SMD = standardized mean difference.

[a] Outlier trial excluded, Li 2017b. Heterogeneity is explained in part by the contribution of the good quality study; the others are fair quality.

[b] Outlier trials excluded, Li 2017b and Bernal-Utera 2020, the latter was identified in Surveillance Report 1 and was small (N=43), a huge outlier and increased heterogeneity by 30%.

Table H-3. Knee osteoarthritis pain (KQ 3) strength of evidence

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
Exercise	*Exercise vs. usual care, attention control, or no intervention*	Function *Short-term*	9 (N=832) Bennell 2005 de Rooij 2017[a] Lund 2008 Quilty 2003 Rewald 2020 (new) Rosedale 2014 Segal 2015 Thorstensson 2005 Williamson 2007	Moderate	Consistent	Precise	Undetected	Moderate	Pooled SMD −0.29 (95% CI −0.44 to −0.12), I^2=4.2%
	Exercise vs. usual care, attention control, or no intervention	Function *Intermediate-term*	12 (N=1,144) Allen 2018[a] Chen 2014 Huang 2005a Huang 2005b Huang 2003 Mat 2017[a] Messier 2004 Messier 2021 (new) Quilty 2003 Segal 2015 Sullivan 1998 Weng 2009	Moderate	Inconsistent[b]	Imprecise	Undetected	Low	Pooled SMD −0.57 (95% CI −1.07 to −0.08), I^2=91.9% [excluding outlier trial][b]
	Exercise vs. usual care, attention control, or no intervention	Function *Long-term*	6 (N=1,541) Allen 2018[a] Messier 2004 Messier 2021 (new) Munukka 2020 (new) Thomas 2002 Waller 2017[a]	High	Consistent	Precise	Undetected	Low	Pooled SMD −0.18 (95% CI −0.28 to −0.03), I^2=0%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
	Exercise vs. usual care, attention control, or no intervention	Pain *Short-term*	9 (N=832) Bennell 2005 de Rooij 2017[a] Lund 2008 Quilty 2003 Rewald 2020 (new) Rosedale 2014 Segal 2015 Thorstensson 2005 Williamson 2007	Moderate	Consistent	Precise	Undetected	Moderate	Pooled difference −0.50 (95% CI −0.84 to −0.16) on a 0 to 10 scale, I^2=37.5% One fair-quality trial (Bennell 2005) found no statistical difference between exercise and sham in proportion with clinically relevant reductions (≥1.75 points) in: VAS pain on movement: 58% (34/59) vs. 42% (27/65); RR 1.4, 95% CI 1.0 to 2.0; VAS global improvement in pain: 59% (35/59) vs. 50% (33/65); RR 1.2, 95% CI 0.8 to 1.6
	Exercise vs. usual care, attention control, or no intervention	Pain *Intermediate-term*	12 (N=1,141) Allen 2018[a] Chen 2014 Huang 2005a Huang 2005b Huang 2003 Mat 2017[a] Messier 2004 Messier 2021 (new) Quilty 2003 Segal 2015 Sullivan 1998 Weng 2009	Moderate	Inconsistent	Imprecise	Undetected	Low	Pooled difference −1.21 (95% CI −1.96 to −0.44) on a 0 to 10 scale, I^2=92.1%
	Exercise vs. usual care, attention control, or no intervention	Pain *Long-term*	6 (N=1,538) Allen 2018[a] Messier 2004 Messier 2021 (new) Munukka 2020 (new) Thomas 2002 Waller 2017[a]	High	Consistent	Precise	Undetected	Low	Pooled difference −0.26 (95% CI −0.43 to −0.01) on a 0 to 10 scale, I^2=0%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
	Exercise vs. usual care, attention control, no intervention, or pharmacologic therapy	Harms	10 (N=1,446) Abbott 2013 Bennell 2005 Chen 2014 Ettinger 1997 Huang 2003 Holsgaard-Larsen 2018 and 2017[a] Messier 2021 (new) Rewald 2020 (new) Thorstensson 2005 Weng 2009	Moderate	Consistent	Precise	Undetected	Moderate	One RCT in older patients reported six serious adverse events, with no significant difference between groups: five in the exercise group [four falls (1 resulting in distal radius fracture), one foot fracture from dropping a dumbbell] vs. one instance of sudden death in a control participant; 1.7% (5/290) vs. 0.7% (1/149), RR 2.57 (95% CI 0.30 to 21.79) One trial reported greater temporary, minor increases in pain in the exercise group versus a sham group; however, four trials found no difference in worsening of pain symptoms with exercise vs. comparators. No difference in adverse events was reported on the one new trial of exercise compared to standard analgesics and anti-inflammatory therapy.
Physical Modalities	*Ultrasound vs. sham*	Function, *Short-term*	4 (N=324) Jia 2016[b] Karakas 2020 (new) Yegin 2017[b] Yildiz 2015	Moderate	Unknown	Imprecise	Undetected	Low	Continuous and pulsed ultrasound vs. sham: 3 RCTs, pooled difference −2.50 (95% CI −6.37 to 1.22) on the 0 to 24 Lequense Index, I^2=94.0%; 1 RCT, difference −2.50 (95% CI −8.11 to 3.12) on the 0 to 68 WOMAC Physical Function scale

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
	Ultrasound vs. sham	Pain *Short-term*	4 (N=324) Jia 2016[b] Karakas 2020 (new) Yegin 2017[b] Yildiz 2015	Moderate	Unknown	Imprecise	Undetected	Low	Continuous and pulsed ultrasound vs. sham, pooled difference −1.07 (95% CI −2.81 to 0.67) on a 0 to 10 scale, I^2=86.8%
	Ultrasound vs. sham	Harms	5 (N=393) Cakir 2014 Jia 2016[b] Karakas 2020 (new) Yegin 2017[b] Yildiz 2015	Moderate	Unknown	Imprecise	Undetected	Low	No adverse events reported during four trials (1 good, 2 fair, and 1 poor quality). One, good-quality trial reported 2 withdrawals (4.2%) due to severe knee pain in the sham group only.
Physical Modalities	*TENS vs. sham*	Function *Short-term*	1 (N=220) Reichenback 2022 (new)	Low	Unknown	Imprecise	Undetected	Low	Difference 0.08 (95% CI –0.28 to 0.43) on 0-63 WOMAC physical function scale
	TENS vs. sham	Pain *Short-term*	1 (N=220) Reichenback 2022 (new)	Low	Unknown	Imprecise	Undetected	Low	Proportion of patients who achieved ≥50% and ≥30% improvement in WOMAC pain, respectively: 38% vs. 41%, RR 0.9 (95% CI 0.7 to 1.3) and 62% and 50%, RR 1.2 (95% CI 0.9 to 1.6) Difference 0.01 (95% CI −0.37 to 0.39) on a 0-20 WOMAC pain scale; Difference 0.09 (95% CI –0.41 to 0.59) on a 0 to 10 VAS scale

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
	TENS vs. sham	Harms	2 (N=290) Fary 2011 Reichenback 2022 (new)	Low	Unknown	Imprecise	Undetected	Low	No evidence of increased risk of serious harms. No differences between treatments for minor harms across both trials (12% both groups; pooled RR 0.98, 95% CI 0.53 to 1.8) or for discontinuation due to minor events in one trial (1% vs. 2%; RR 0.52, 95% CI 0.05 to 5.6).
Physical Modalities	*Low-level laser therapy vs. sham laser*	Function *Short-term*	2 (N=133) Alqualio-Costa 2021 (new) Al Rashoud 2014	Moderate	Consistent	Imprecise	Undetected	Low	Pooled SMD −0.39 (95% CI −0.80 to 0.00), I^2=0%
	Low-level laser therapy vs. sham laser	Function *Intermediate-term*	3 (N=193) Alqualio-Costa 2021 (new) Al Rashoud 2014 Tascioglu 2004	Moderate	Inconsistent	Imprecise	Undetected	Low	Pooled SMD −0.54 (95% CI −1.19 to 0.05), I^2=46.5%
	Low-level laser therapy vs. sham laser	Pain *Short-term*	3 (N=160) Alqualio-Costa 2021 (new) Al Rashoud, 2014 Hegedus 2009	Moderate	Inconsistent	Imprecise	Undetected	Low	Pooled difference −1.50 (95% CI −3.18 to 0.16) on a 0 to 10 scale, I^2=76.5%
	Low-level laser therapy vs. sham laser	Pain *Intermediate-term*	3 (N=193) Alqualio-Costa 2021 (new) Al Rashoud, 2014 Tascioglu, 2004	Moderate	Inconsistent	Imprecise	Undetected	Low	Pooled difference −1.24 (95% CI −2.22 to 0.12) on a 0 to 0 scale, I^2=6.5%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
Physical Modalities	*Interferential current vs. sham*	Function *Short-term*	1 (N=84) Alqualo-Costa 2021 (new)	Low	Unknown	Imprecise	Undetected	Low	Difference 0.55 (95% CI −24.31 to 7.05) on 0 to 96 WOMAC total score Difference –1.10 (95% CI −3.11 to 0.89) on 0 to 24 Lequesne Functional Index
	Interferential current vs. sham	Function *Intermediate-term*	1 (N=84) Alqualo-Costa 2021 (new)	Low	Unknown	Imprecise	Undetected	Low	Difference 1.42 (95% CI −6.73 to 9.58) on 0 to 96 WOMAC total score Difference –0.16 (95% CI −2.15 to 1.81) on 0 to 24 Lequesne Functional Index
	Interferential current vs. sham	Pain *Short-term*	1 (N=84) Alqualo-Costa 2021 (new)	Low	Unknown	Imprecise	Undetected	Low	Difference –0.87 (95% CI −2.01 to 0.26) on 0 to 10 scale at rest Difference –0.42 (95% CI −1.65 to 0.80) on 0 to 10 scale during activity
	Interferential current vs. sham	Pain *Intermediate-term*	1 (N=84) Alqualo-Costa 2021 (new)	Low	Unknown	Imprecise	Undetected	Low	Difference –0.32 (95% CI −1.34 to 0.70) on 0 to 10 scale at rest Difference 0.49 (95% CI −1.63 to 0.64) on 0 to 10 scale during activity
Manual Therapies	*Massage vs. usual care*	Function, Pain, Harms *Short-term*	2 (N=185) Pehlivan 2019 (new) Perlman 2012	Moderate	Unknown	Imprecise	Undetected	Insufficient	Insufficient evidence from two unblinded trials (one fair, one poor quality).
Mind-body Practices	*Yoga vs. attention control*	Pain, Harms *Short-term*	1 (N=112) Park 2021 (new)	High	Unknown	Imprecise	Undetected	Insufficient	Insufficient evidence from one unblinded, poor-quality trial

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
	Tai Chi or Qigong vs. attention control or usual care	Function *Intermediate-term*	3 (N=398) Hu 2020 (new) Wang 2009 Xiao 2021b (new)	Moderate	Inconsistent[f]	Imprecise	Undetected	Low	Pooled SMD –0.48 (95% CI –1.03 to –0.17), I^2=37.8% [excluding poor-quality trial][c]
	Tai Chi or Qigong vs. attention control or usual care	Pain *Intermediate term*	3 (N=398) Hu 2020 (new) Wang 2009 Xiao 2021b (new)	Moderate	Consistent	Imprecise	Undetected	Low	Pooled SMD –0.75 (95% CI –1.05 to –0.42), I^2=0% [excluding poor-quality trial][c]
	Qigong vs. exercise	Function *Intermediate-term*	1 (N=68) Xiao 2021a (new)	Moderate	Unknown	Imprecise	Undetected	Insufficient	Insufficient evidence from one small, unblinded trial
		Pain *Intermediate-term*	1 (N=68) Xiao 2021a (new)	Moderate	Unknown	Imprecise	Undetected	Insufficient	Insufficient evidence from one small, unblinded trial
Acupuncture	*Acupuncture vs. usual care, no treatment, waitlist, or sham*	Function *Short-term*	5 (N=954) Jubb 2008 Lam 2021 (new) Suarez-Almazo 2010 Yurturan 2007 Witt 2005	Moderate	Inconsistent[g]	Precise	Undetected	Low	Pooled SMD −0.11 (95% CI −0.27 to 0.22) [Excluding outlier][d]
	Acupuncture vs. usual care, no treatment, waitlist, or sham	Pain *Short-term*	7 (N=1,148) Berman 1999 Jubb 2008 Lam 2021 (new) Suarez-Almazo 2010 Williamson 2007 Witt 2005 Yurturan 2007	Moderate	Inconsistent	Precise	Undetected	Low	Pooled SMD −0.25 (95% CI −0.58 to 0.07), I^2=73.4% Proportion of patients with ≥30% and ≥50% improvement on VAS pain: 59% vs. 56% and 39% vs. 36%, respectively; p=NS

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
	Acupuncture vs. usual care, no treatment, waitlist, or sham	Harms	10 (N=1,879) Berman 2004 Berman 1999 Hinman 2014 Jubb 2008 Lam 2021 (new) Lansdown 2009 Suarez-Almazo 2010 Williamson 2007 Witt 2005 Yurtkuran 2007	Moderate	Consistent	Imprecise	Undetected	Moderate	There is no apparent difference in risk of serious adverse events between any form of acupuncture and the control group. Worsening of symptoms (7%–14%), mild bruising, swelling or pain at the acupuncture site (1% to18%) were most common; One case of infection at an electroacupuncture site was reported.

CI = confidence interval; KOOS = Knee Injury and Osteoarthritis Outcome Score; KQ = Key Question; MCID = minimal clinically important difference; MI = motivation interviewing; NSAIDs = non-steroidal anti-inflammatory drugs; OA: osteoarthritis; RCT = randomized controlled trial; RR = risk ratio; SMD = standardized mean difference; TENS = transcutaneous electrical stimulation; VAS = visual analog scale; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index.

[a] New Exercise trial identified for 2020 report update.

[b] New Physical Modality (ultrasound) trial identified for 2020 report update.

[c] Poor-quality trial identified for Surveillance Report 3 excluded, Hu 2020 – heterogeneity decreased from 80.2% to 37.8%.

[d] Outlier excluded, Berman 1999.

Table H-4. Fibromyalgia (KQ 4) strength of evidence

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
Exercise	*Exercise vs. usual care, attention control, or a placebo intervention*	Function *Short-term*	9 (N=545) Altan 2009 Baptista 2012 Da Costa 2005 Garrido-Ardila 2021 (new) Giannotti 2014 Kayo 2012 King 2002 Paolucci 2015 Patru 2021 (new)	Moderate	Inconsistent	Precise	Undetected	Low	Pooled difference −8.39 (95% CI, −12.87 to −3.61) on a 0 to 100 scale, I^2=56.8%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
	Exercise vs. usual care, attention control, or a placebo intervention	Pain *Short-term*	7 (N=406) Altan 2009 Buckelew 1998 Da Costa 2005 Garrido-Ardila 2021 (new) Giannotti 2014 Gusi 2006 Kayo 2012	Moderate	Consistent[a]	Imprecise	Undetected	Moderate	Pooled difference −0.84 (95% CI −1.24 to −0.30) on a 0 to 10 scale, I^2=0.8%; (Excluding outlier)[a]
	Exercise vs. usual care, attention control, or a placebo intervention	Harms	4 (N=201) Garrido-Ardila 2021 (new) Gusi 2006 Kayo 2012 Paolucci 2015	Moderate	Unknown	Imprecise	Undetected	Insufficient	Insufficient data on harms. Most trials of exercise did not report on adverse events at all. One trial reported one case of knee pain exacerbation requiring rest and another reported one non-study-related adverse event. Two trials reported no adverse events.

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
Manual Therapies	*Spinal Manipulation vs. sham*	Function *Short-term*	1 (N=101) Coste 2021 (new)	Moderate	Unknown	Imprecise	Undetected	Low	Adjusted difference 1.2 (95% CI −4.9 to 7.3) on the 0 to 100 FIQ
	Spinal Manipulation vs. sham	Function *Intermediate -term*	1 (N=101) Coste 2021 (new)	Moderate	Unknown	Imprecise	Undetected	Low	Adjusted difference −1.1 (95% CI −7.9 to 5.6) on the 0 to 100 FIQ
	Spinal Manipulation vs. sham	Pain *Short-term*	1 (N=101) Coste 2021 (new)	Moderate	Unknown	Imprecise	Undetected	Low	Adjusted difference −0.56 (95% CI −2.21 to 1.08) on a 0 to 10 scale Global improvement in pain: OR 1.44 (95% CI 0.60 to 3.43)
	Spinal Manipulation vs. sham	Pain *Intermediate -term*	1 (N=101) Coste 2021 (new)	Moderate	Unknown	Imprecise	Undetected	Low	Adjusted difference −0.50 (95% CI −2.48 to 1.47) on a 0 to 10 scale Global improvement in pain: OR 1.51 (95% CI 0.65 to 3.51)
	Spinal Manipulation vs. sham	Harms	1 (N=195) Castro-Sanchez 2011[a] Coste 2021 (new)	Moderate	Inconsistent	Imprecise	Undetected	Insufficient	Data for harms were insufficient; however, no adverse effect, including serious events, occurred in two fair quality trials
Mindfulness Practices	*Mindfulness-based stress reduction or "Meditation Awareness Training: vs. waitlist or attention control*	Function *Intermediate term*	2 (N=298) Perez-Aranda 2019 (new) Van Gordon 2017[b]	Moderate	Consistent	Precise	Undetected	Low	Pooled difference −8.42 (95% CI −12.87 to −4.93) on the 0-100 FIQ-R, I^2=0%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
	Mindfulness-based stress reduction or "Meditation Awareness Training: vs. waitlist or attention control	Harms	1 (N=150) Perez-Aranda 2019 (new)	High	Unknown	Imprecise	Undetected	Insufficient	Eight (16%) patients randomized to MBSR reported adverse events that occurred with varying frequency and included mild fatigue, intense palpitations, fatigue, tension, headaches, dizziness, somnolence, gain of weight, and loss of sexual desire.
Mind-Body Therapies	*Basic Body Awareness Therapy vs. usual care*	Pain *Short- and intermediate -term*	1 (N=39) Bravo 2019 (new)	Moderate	Unknown	Imprecise	Undetected	Insufficient	Insufficient evidence from one small, fair quality trial due to lack of information on variability, precluding estimation of effect size with corresponding confidence interval.
Acupuncture	*Acupuncture vs. sham or usual care*	Function *Short-term*	Sham or no treatment 4 (N=350) Garrido-Ardila 2021 (new) Karatay 2018[c] Martin 2006 Vas 2016 Sham control 3 (N=283) Karatay 2018[c] Martin 2006 Vas 2016	Moderate	Consistent	Precise	Undetected	Moderate	Pooled difference, all control conditions (4 trials): −8.60 (95% CI −12.00 to −5.42) on a 0 to 100 scale, I^2=0% Pooled difference, sham only (3 trials): −9.21 (95% CI −13.65 to −5.78) on a 0-100 scale, I^2=0%

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
	Acupuncture vs. sham or usual care	Pain *Short-term*	Sham, attention control, or no treatment 6 (N=466) Assefi 2005 Garrido-Ardila 2021 (new) Karatay 2018[c] Martin 2006 Mist 2018[c] Vas 2016 Sham control 4 (N=369) Assefi 2005 Karatay 2018[h] Martin 2006 Vas 2016	Moderate	Inconsistent	Precise	Undetected	Low	Pooled difference, all control conditions (6 trials): −1.04 (95% CI −2.27 to 0.16) on a 0 to 10 scale, I^2=89.5% Pooled difference, sham only (4 trials): −0.86 (95% CI −2.73 to 0.92) on a 0 to 10 scale, I^2=88.9%
	Acupuncture vs. exercise	Function, Pain and Harms *Short-term*	1 (N=70) Garrido-Ardila 2021 (new)	High	Unknown	Imprecise	Undetected	Insufficient	Insufficient evidence from one poor quality trial
	Acupuncture vs. sham, usual care, or exercise	Harms	5 (N=369) Assefi 2005 Garrido-Ardila 2021 (new) Karatay 2018[c] Martin 2006 Vas 2016	Moderate	Consistent	Precise	Undetected	Moderate	Discomfort and bruising were the most common reported adverse events and were more common in the true acupuncture groups. Discomfort was substantially more common for acupuncture or sham needling (61%to 70%) compared with simulated acupuncture (29%). Vasovagal symptoms and aggravation of fibromyalgia symptoms were less common (4% of sessions)

Intervention	Comparator	Outcome	Number of RCTs (Patients) Author Year	Study Limitations	Consistency	Precision	Reporting Bias	Strength of Evidence	Findings, Direction and Magnitude of Effect
Multidisciplinary Rehabilitation	*Multi-disciplinary rehabilitation vs. usual care or waitlist*	Function *Short-term*	4 (N=445) Amris 2014 Castel 2013 Patru 2021 (new) Saral 2016 ("long-term" intervention arm)[d]	Moderate	Consistent[j]	Imprecise	Undetected	Low	Pooled mean difference −4.89 (95% CI −11.06 to 0.36) on the 0 to 100 FIQ, I^2=58.3% Proportion with clinically meaningful improvement in FIQ total score compared with usual care at short (OR 3.1, 95% CI 1.6 to 6.2)
	Multi-disciplinary rehabilitation vs. exercise	Function *Short-term*	1 (N=66) Patru 2021 (new)	High	Unknown	Imprecise	Undetected	Insufficient	Insufficient evidence from one small, poor-quality trial

CBT = cognitive behavioral therapy; CI = confidence interval; EMG = electromyography; FIQ = Fibromyalgia Impact Questionnaire; KQ = Key Question; MD = mean difference; MPQ = McGill Pain Questionnaire; NDI = Neck Disability Index; OR = odds ratio; PSFS = Patient Specific Functional Scale; RCT = randomized controlled trial; RR = risk ratio; SD = standard deviation; VAS = visual analog scale.

[a] Outlier excluded, Baptista 2012.

[b] New Mindfulness Practices trial identified for 2020 Report Update.

[c] New Acupuncture trial trial identified for 2020 Report Update.

[d] The "long-term" multidisciplinary arm (2 days of education and exercise followed by 10 weeks of CBT) was determined to be most consistent with interventions employed by the other trials and was included in the pooled estimates; results for the "short-term" group (2 days of education, exercise and CBT programs) were similar to those of the "long-term" group and are detailed in Table 42 of the full report.