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Review Article

Mind-body therapies in traditional Chinese medicine for Neuropathic Pain: A Systematic Review of Randomized Controlled Trials

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ABSTRACT

Objectives: To evaluate the effectiveness and safety of traditional Chinese medicine (TCM) mind-body therapies in patients with neuropathic pain. ***Design:*** This systematic review was undertaken according to the PRISMA 2020 statement.
Data sources: We searched randomized controlled trials (RCTs) in seven English databases and four Chinese databases up to March 2022.
Review/Analysis methods: The Cochrane Risk of Bias 2 was used for the quality assessment, and the mean difference with a 95% confidence interval for data pooling. The review was registered in the INPLASY (INPLASY202240016).
Results: Twenty-three RCTs were identified, including 1,693 patients with lumbar herniated discs (LHD), cervical spondylotic radiculopathy (CSR), sympathetic cervical spondylosis (SCS), trigeminal neuralgia, and central poststroke pain. Pooled results showed that for LHD, TCM mind-body therapy used alone (MD: -0.57, [-0.77, -0.36], P<0.01, week 8) or combined with physiotherapy (MD: -1.02, [-1.12, -0.91], P<0.01, week 4) showed advantages over physiotherapy alone on pain relief. However, there was no statistical difference on physical function. For CSR, TCM mind-body movement combined with physiotherapy had better effect than physiotherapy alone on pain relief (MD: -1.15, [-1.37, -0.94], P<0.01, week 4). Six trials reported safety. Nausea, dizziness, fatigue, and pain at the acupuncture point were observed.
Conclusions: Low-quality evidence showed that TCM mind-body therapies might reduce pain intensity and improve physical function when used as an adjuvant therapy or monotherapy. There is a need to conduct high-quality trials to confirm the effectiveness and safety of TCM mind-body therapies for neuropathic pain.

According to the International Association for the Study of Pain (IASP), neuropathic pain is defined as pain-related lesions or diseases involving the somatosensory nerves (Scholz et al., 2019). Pain is characterized by spontaneous (continuous or paroxysmal) temporal characteristics or an exaggeration of the pain level. A sense of burning, tingling, shooting, stabbing, or shocking can occur (Derry et al, 2019).

A systematic review including studies in Brazil, Canada, China, Europe, and the United States estimated that the prevalence rate of neuropathic pain ranged from 6.9% to 10% (van Hacke et al, 2014). The reported incidence rate of chronic pain with neuropathic features was 6.9% to 17.9% in Brazil, Canada, France, the United Kingdom, and the United States (van Hacke et al., 2014). Studies in the United States investigated patients with peripheral and central neuropathic pain and found that 80.8% of the participants suffer from moderate or severe pain (Schaefer et al, 2014a). Another survey in the United States showed that this condition resulted in high consumption of health care resources by 90.2% of participants who were prescribed one or more medications. The

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condition caused impaired working ability of 66.4% ± 25.1% patients (Schaefer et al, 2014b).

Analgesics such as antidepressants, antiepileptics were administered to cure this pain (NICE, 2020a), but there was no sufficient evidence to prove their safety and efficacy (Derry et al., 2019; Zhou et al., 2017; Duehmke et al., 2017; Wiffen et al., 2017).

Mind-body therapies are based on the holistic principle that mind, body, and behavior are interconnected and can improve psychological and physical well-being, which allows patients to take an active role in their treatment and to promote their ability to cope (Theadom et al., 2015). It focuses on the interaction between the mind and body using internal awareness, anatomic alignment, and deep breathing to improve individual wellness (Gendron et al., 2018) and is usually administered or taught by a trained practitioner or teacher (National Center for Complementary and Integrative Health, 2017).

A systematic review of 20 distinct meta-analyses showed that mindfulness and mindful movements had positive effects on improving depressive symptoms in patients with chronic pain (Sud et al., 2021). Combined physical and psychological programs are recommended by the National Institute for Health and Care Excellence (NICE) Guidelines for people with persistent low back pain or sciatica (NICE, 2020b).

There are numerous mind-body therapies (Fogaça, et al., 2021) derived from the holism concept of traditional Chinese medicine (TCM). Examples of TCM mind and body therapies include: (1) active mind-body movement therapies such as Taiji (*太极*), Qigong (*气功*), Baduanjin (*八段锦*), Wuqinxi (*五禽戏*), Yijinjing (*易筋经*), and Liuzijue (*六字诀*); (2) passive mind-body movement therapies such as mind regulating acupuncture and Tuina; (3) motionless interventions such as TCM meditation, Zhan Zhuang (*站桩*), Neikan (*内观*); and (4) mind-body sensory therapies such as five tone music therapy, TCM aromatherapy.

This systematic review aimed to comprehensively retrieve and assess evidence to evaluate the effectiveness and safety of TCM mind-body therapies for patients with neuropathic pain.

Methods

This review was started on February 1, 2022, and registered in the INPLASY on April 4, 2022 (INPLASY202240016). Table A.1 in the supplementary material enlists the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist (Page et al., 2021).

To minimize the heterogeneity between trials and evaluate the effectiveness at different time points, we added observation time points as a subgroup.

Eligibility Criteria

Participants

Adults (aged ≥18 years) with confirmed neuropathic pain without any limitation on body parts and original causes were included. The IASP diagnostic criteria were used to determine neuropathic pain, including trigeminal neuralgia, peripheral nerve injury, painful polyneuropathy, postherpetic neuralgia, and painful radiculopathy (Scholz et al., 2019). Central neuropathic pain included pain caused by spinal cord or brain injury, post-stroke pain, and pain associated with multiple sclerosis. Diseases could be diagnosed based on national or international guidelines or the World Health Organization (WHO)International Statistical Classification of Diseases (ICD-10).

The participants were included irrespective of their sex, race, and comorbidities. Those with conditions such as complex regional pain syndrome type I, low back pain without radicular pain, fibromyalgia, and atypical facial pain were excluded.

Interventions

Interventions included mind-body therapies in TCM. Two aspects of mind and body were involved, which could be reflected in the study reports by names, introduction/clarification of the interventions, or the type of outcomes they assessed. For example, treatments were considered eligible if the outcomes assessed covered both aspects of mind (such as psychometric scale) and body (such as pain scale), or the name of the intervention indicated both psychological and physical components. The form or course of the treatment was not restricted.

Mind-body therapies that did not involve TCM perspectives were excluded, such as yoga, pilates, and music therapy. Mind-body therapies combined with other complementary interventions were also excluded.

Comparators

These included but were not limited to placebo, no treatment, waitlist control, usual care such as carbamazepine for trigeminal neuralgia, and amitriptyline, duloxetine, gabapentin, and pregabalin as initial treatments for other neuropathic pain.

Studies with psychological interventions, non-TCM mind-body practices, and treatments without research evidence (not recommended in the guidelines or reported as “insufficient evidence” in systematic reviews) as comparators were excluded.

Main Outcomes

Pain intensity or pain relief measurements with validated tools such as pain assessment scales (such as visual analog scale [VAS], numerical rating scale [NRS], verbal rating scale, etc.), or neuropathic pain specific instruments (such as neuropathic pain screening tool, Douleur Neuropathique 4 questions [DN4], neuropathic pain questionnaire, Leeds Assessment of Neuropathic Pain Symptoms and Signs scale [LANSS]).

Additional outcomes

Based on the recommendations of the IASP, additional outcomes included the following items: (1) physical functioning, emotional functioning; (2) global judgment of improvement; (3) satisfaction with treatments as rated by participants; and (4) adverse events (Dworkin et al., 2005). Other pain-related outcomes were included, such as the occurrence of pain, time period, and distribution of pain, analgesic drug use, pain-related hospitalizations, and rehabilitation measured using scales.

Study design

Randomized controlled trials (RCTs) without limitations on blinding or publication status were included, but crossover trials were excluded.

Search Strategy

The search strategy comprised a juxtaposition of the two aspects of TCM mind-body therapies. We searched for RCTs of TCM therapies that have been widely accepted as mind-body therapies for neuropathic pain. However, retrieval aimed at TCM interventions, such as acupuncture and massage, that could use mind-body techniques for neuropathic pain. The two parts were searched together in each database. Search strategies included the aspects

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Table 1
Methods Used for Statistical Heterogeneity Assessment

I^2-values	0%≤ and ≤30%	>30% and ≤50%	>50% and ≤75%	>75%
Heterogeneity	not important	moderate	substantial	considerable

of mind-body-related techniques in traditional Chinese medicine, mind body, neuropathic pain, and "random" or "control".

Chinese and English databases were comprehensively searched to find eligible RCTs published or unpublished from their inception to March 09, 2022. The English databases were MEDLINE, EMBASE, the Cochrane library, PubMed, Web of Science, PsycINFO, Alt HealthWatch, and ProQuest; the Chinese databases were China National Knowledge Infrastructure (CNKI), Wanfang Database, Chinese Scientific Journal Database (VIP), and Sino-Med Database. Table A.2 in the supplementary meterial presents the complete strategy.

Study Selection and Data Extraction

Initially, duplicate research was removed. Four authors independently assessed eligibility by screening the titles and abstracts. After removing the ineligible studies, the full texts were screened by two authors to determine the RCTs that met our inclusion criteria. A third author made the final decision whenever there were any disagreements.

For data extraction, a predesigned Excel sheet was piloted and used. General information (publication status, author, country, content language, publication year), participant characteristics, interventions, controls, comparisons, study design, outcomes, and safety measurements were extracted.

Assessment of Risk of Bias

The Cochrane Risk-of-Bias Tool 2 was used to assess the quality of the included RCTs. Two authors independently evaluated the risk of bias.

Data Synthesis

Review Manager 5.4 was used to pool the data when possible. Intention-to-treat (ITT) data were used for analysis when reported. The risk ratio (RR) with 95% confidence interval (CI) was used to present binary data, and the mean difference (MD) or standardized mean differences (SMD) with 95% CI were used to present continuous data. The overall effect size of 0.2 to 0.5 was regarded as small, 0.5 to 0.8 as moderate, and >0.8 as large.

Statistical heterogeneity was assessed using the I^2 statistic. When I^2 was between 0% and 30%, the heterogeneity was considered as not important; when it was >30% and <50%, the heterogeneity was considered as moderate; when it was >50% and <75%, the heterogeneity was considered substantial; when it was >75%, the heterogeneity was considered as considerable (Table 1). Funnel plots were used in at least 10 studies (Higgins and Thomas, 2022).

When I^2 was >50%, further investigation of potential heterogeneity sources was conducted using sensitivity analysis. For the primary outcome, sensitivity analyses were performed to determine whether the review conclusions would be different if eligibility was restricted to trials with a low risk of selection bias.

The subgroup analysis was planned based on the following factors: (1) types of therapy; (2) types of comparisons and comparator(s) (such as drugs or non-drugs); (3) different anatomic sections of neuropathic pain; and (5) different observation time points.

Results

Study Selection

The initial search was conducted until March 9, 2022, and had 43,586 records. Among these, 13,847 duplicate references were removed, 29,902 records excluded, and 815 were assessed with full text. Twenty-three trials were eventually performed, seven of which were included in the quantitative analysis. The details are shown in Figure 1 (Page et al., 2021).

Study Characteristics

Twenty-three single-center RCTs conducted in China met the inclusion criteria. A total of 1,693 participants had lumbar herniated disc (877 participants), cervical spondylotic radiculopathy (458 participants), sympathetic cervical spondylosis (90 participants), trigeminal neuralgia (65 participants), and central post-stroke pain (203 participants). Their ages ranged from 29 to 76 years old. The TCM mind-body modalities included: (1) Baduanjin (八段锦) (Feng & Qin, 2017; Han, 2015; Lin, 2018; Pang et al., 2013; Shang 2014; Xu et al., 2015; Xu et al., 2018; Yuan et al., 2019); (2) Daoyin (导引) (Chen et al., 2014; Li et al., 2020); (3) Yijinjing (易筋经) (Guo, 2020; Ji, 2021; Yang, Zhi, & Zhao, 2019); (4) Wuqinxi (五禽戏) (Li, 2017; Weng, 2021); (5) Taiji (太极) (Liu et al., 2018; Song, 2006); (6) mind regulating acupuncture (调神针刺) (Pan et al., 2017; Qiao and Yan, 2019; Wang, 2019); (7) aroma massage (Fu, 2021); (8) Qigong (气功) (Zheng, 2019); and (9) mind regulating Du channel-unblocking (通督调神/tongdu tiaoshen) massage (Zhang, 2020). The comparators included physiotherapies (such as TCM manipulation, neck exercise, transcutaneous electrical nerve stimulation [TENS], and traction), medicine, and nerve block. Table 2 reports the characteristics of the included studies. Table A.3 in the supplementary material reports the brief introductions and sources of the TCM mind-body therapies included.

Quality Assessment of Methodology

Among 23 included RCTs, five did not report the details of randomization. Two trials used sealed opaque envelopes and few others did not mention the process of allocation concealment. However, the risks were considered high in all trials because of apparent differences between the treatment and control groups. One trial used ITT analysis and five reported drop-offs, four of which missed <5% of the data. The trial reported more than 5% of missing data included two comparisons. In one comparison, 14% and 12% of participants dropped because they gave up practicing the movements in the control and treatment groups. In another comparison, 2% and 4% of participants dropped due to adverse events in the two groups. According to Cochrane Risk-of-Bias Tool 2, we consider less than 5% of missing data was related to health status in these trials and rated them low risk of bias regarding missing outcome data (Fig. 2).

Effectiveness and Safety

A summary of the effectiveness of the TCM mind-body therapies for patients with neuropathic pain is presented in Table 3.

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Table 2
Characteristics of Included Trials

Study ID	Disease (course: T; C)	TCM mind body therapy modality (OTP)	Sample size analysed and drop-off reasons	Treatment group		Control group		Outcome indicators
				Sample size randomized (male-female) / age (M ± SD)	Intervention	Sample size randomized (male-female) / age (M ± SD)	Intervention	
Chen SQ 2014	LDH (unclear)	Daoyin (导引) (2W)	60, no drop-off reported	30 (unclear) / (unclear)	Daoyin: Bid, for 2 weeks	30 (unclear) / (unclear)	Manipulation: 3 times a week, for 2 weeks	VAS score[a], JOA score[c], 3-month follow up (VAS)[(a]
Feng L 2017	Cervical spondylotic radiculopathy (3.21 ± 0.93 M/ C1:3.18 ± 1.04 M/ C2:3.32 ± 0.81 M)	Baduanjin (‘…‘«‘®‘µ‘”‘¦) (4W)	134, T: 7-nonadherence, dizziness aggravating; C1: 2-pain aggravating; C3: 6-nonadherence	50 (26-24) / (45.55 ± 7.33)	Baduanjin, Bid, 20 min each time, for 4 weeks + manipulation, QD, 20 min each time, for 4 weeks	C1: 50 (25-25) / (50.22 ± 4.68) C2: 50 (23-27)/(48.67 ± 6.56)	C1: manipulation, QD, 20 min each time, for 4 weeks C2: manipulation, QD, 20 min each time, for 4 weeks + “米” shaped neck exercise, Bid, 20 min each time, for 4 weeks	Effective rate[b], VAS score[c], 3-month follow up (recurrence rate)[b]
Fu Y 2021	Sympathetic cervical spondylosis (T: 6.00 ± 9.00M/C: 6.00 ± 9.00M)	Aroma massage (12D)	86, T: 1-job changing; T: 2-nonadherence, 1-chosed acupuncture	45 (19-25)/ (31.00 ± 9.50)	Chinese herbs essential oil inhalation and back massage for, QD, 20 min each time, for 12 days	45 (19-23)/ (31.50 ± 13.75)	Manipulation, QD, 30 min each time, for 12 days	CSSEQ[c], NRS[c], NID[c], effective rate[b], safety[d]
Guo H 2020	Cervical spondylotic radiculopathy (unclear)	One move from Yijinjing (‘˜‘”‘-‘‹‘»‘–) (4W, 12W)	60, no drop off reported	30 (unclear) / (unclear)	Palm reset Tianmen state, BID, 30 min each time, 6 times a week, for 12 weeks + manipulation, BID, 3 days each week, for 4 weeks	30 (unclear) / (unclear)	Manipulation, BID, 3 days each week, for 4 weeks	VAS[c], NDI[c], cervical physiological[d] curve[c], computed tomography finite element analysis[b]
Han BL 2015	LDH (T1: 3.26 ± 1.03M; T2: 3.35 ± 1.15M/C1: 3.32 ± 1.46M)	Baduanjin (‘…‘«‘®‘µ‘”‘¦) (4W)	60, no drop off reported	T1:20 (10-10) / (51.35 ± 2.65); T2: 20 (12-8) / (50.11 ± 2.15)	T1: Baduanjin, 40 min each time, 5 days each week, for 4 weeks; T2: Baduanjin, 40 min each time, 5 days each week, for 4 weeks + TENS, 30 min each time, 5 days each week, for 4 weeks	20 (13-7) / (51.82 ± 1.86)	TENS, 30 min each time, 5 days each week, for 4 weeks;	VAS[c], CODI[c]
Ji T 2021	LDH (T: 38.00 ± 18.00W/C: 35.43 ± 12.27W)	Yijinjing (‘˜‘”‘-‘‹‘»‘–) (4W)	60, no drop off reported	30 (13-17) / (54.27 ± 5.46)	Yijinjing, QD, 45 min each time, for 4 weeks + manipulation, QD, for 4 weeks	30 (14-16) / (54.87 ± 5.28)	Manipulation, QD, for 4 weeks	VAS[c], JOA[c], effective rate[a]
Li F 2017	LDH (T1: 1.43 ± 0.24M; T2: 42.65 ± 6.54/C: 1.38 ± 0.52M)	Wuqinxi (‘º‘”‘¦‘½‘^‘–) (9W)	90, no drop off reported	T1: 30 (18-12) / (43.57 ± 7.43) T2: 30 (19-11) / (42.65 ± 6.54)	T1: Wuqinxi, QD, 40 min each time, 5 days each week, for 9 weeks; T2: Wuqinxi, QD, 40 min each time, 5 days each week, for 9 weeks + Manipulation, QD, 30-40 min each time, 5 days each week, for 9 weeks;	C1: 30 (17-13) / (44.13 ± 5.13)	Manipulation, QD, 30-40 min each time, 5 days each week, for 9 weeks	VAS[c], ODI[c], 5-month follow up (VAS, ODI)[c]
Li JH 2020	LDH (T1: 25.9 ± 7.1M; T2: 26.1 ± 7.8M/C: 24.8 ± 6.7M)	Daoyin (‘˜¼‘¼‘•) (4W)	120, no drop off reported	T1: 40 (17-23) / (47.9 ± 11.9); T2: 40 (19-21) / (48.7 ± 12.3)	T1: Daoyin for 4 weeks; T2: Daoyin for 4 weeks + manipulation, 3 days each week, for 4 weeks	40 (18-22) / (48.3 ± 12.1)	Manipulation, 3 days each week, for 4 weeks	VAS[c], ODI[c], effective rate[c]
Lin HR 2018	LDH (10.50 ± 8.41/9.97 ± 8.11)	Baduanjin (‘…‘«‘®‘µ‘”‘¦) (20D)	57, T: 2- reason not reported C-1, reason not reported	30 (16-12) / (40.44 ± 9.53)	Baduanjin, 2 times every 2 days, 2 times each practice, for 20 days + manipulation, 30 min each time, 1 time every 2 days, for 20 days	30 (17-12) / (40.60 ± 7.21)	Manipulation, 30 min each time, 1 time every 2 days, for 20 days	VAS[c], effective rate[a]

(*continued on next page*)

Table 2 (*continued*)

Study ID	Disease (course: T; C)	TCM mind body therapy modality (OTP)	Sample size analysed and drop-off reasons	Treatment group		Control group		Outcome indicators
Liu DZ 2018	Cervical spondylotic radiculopathy (unclear)	Taiji (‘¤‘ª‘~‘) (16W)	60, no drop off reported	30 (16-14) / (50.3 ± 6.5)	Taiji, QD, 60 min each time, 4 times each week, foe 16 weeks + Celebrex, QD, for 16 weeks + “‘±‘³” shaped neck exercise, for 16 weeks	30 (15-15) / (51.2 ± 7.1)	Celebrex, QD, for 16 weeks + “‘±‘³” shaped neck exercise, for 16 weeks	VAS[c], Cervical motion range[c], Lovett score[c]
Pang H 2013	LDH (T: 5.59 ± 3.29M/C: 6.02 ± 2.78)	Baduanjin (‘…‘«‘®‘µ‘™‘¦) (8W)	64, no drop off reported	32 (12-20) / (46.33 ± 9.46)	Baduanjin, QD, 30 min each time, for 8 weeks	32 (14-18) / (47.25±8.43)	Manipulation, QD, 30 min each time, for 8 weeks	VAS[c], JOA[c]
Pan ZQ 2017	Trigeminal neuralgia	Mind regulating acupuncture (4W)	61, 2- adverse events caused by carbamazepine; 1- afraid of acupuncture	33 (13-18) / (54 ± 11)	Mind regulating acupuncture, QD, 30 min each time, 6 days each week, for 4 weeks + Carbamazepine, 400-800 mg, BID, for 4 weeks	32 (12-18) / (59 ± 11)	Carbamazepine, 400-800 mg, BID, for 4 weeks	Effective rate[b], VAS(+), pain occurrence rate[a], SF-36[c], 6-month follow up (VAS[c], pain occurrence rate[c], SF-36[c])
Qiao HZ 2019	Central post-stroke pain	Mind regulating and pain suppression acupuncture (4W, 8W)	80, no drop off reported	40, (24-16) / (70.09 ± 6.87)	Mind regulating and pain suppression acupuncture, BID, for 8 weeks + Gabapentin capsule, 0.1 g, TID, for 8 weeks + pregabalin capsule, 75 mg, BID, for 8 weeks + TENS, for 4 weeks	40, (23-17) / (70.41 ± 6.98)	Gabapentin capsule, 0.1 g, TID, for 8 weeks + pregabalin capsule, 75 mg, BID, for 8 weeks + TENS, for 4 weeks	VAS[c], PSQI[c], S100β[c], NSE[c], effective rate[c], safety[d]
Shang QQ 2014	LDH (unclear)	Baduanjin (‘…‘«‘®‘µ‘™‘¦) (Not reported)	60, no drop off reported	30, (unclear) / (unclear)	Baduanjin + manipulation	30, (unclear) / (unclear)	Manipulation	VAS[c], JOA[c]
Song H 2006	LDH (T: 12.71 ± 9.66M/C: 12.94 ± 8.22M)	Taiji (‘¤‘ª‘~‘) (6M)	68, no drop off reported	37 (22-15) / (42.69 ± 15.38)	Taiji, 60 min each time, for 6 months + usual care	31 (19-12) / (40.72 ± 13.10)	Usual care, physiotherapy mainly	Vital capacity[a], heart rate, systolic blood pressure[a], systolic blood pressure[d], sit and reach length[c], weight[c], straight leg raising test angle[c], VAS[c], JOA score[b], effective rate[d], nervus peroneus communis conduction rate[a], superficial peroneal nerve conduction rate[c]
Weng BQ 2021	LDH (unclear)	Wuqinxi (‘ª‘™‘¦‘½‘ˆ‘–) (4W)	62, T: 1- non adherence; C: 2- non adherence, 1- consumed other medicine	33 (unclear) / (unclear)	Wuqinxi, BID, 5 min each time, for 4 weeks + manipulation, 1 time every 3 days, for 4 weeks	33 (unclear) / (unclear)	Manipulation, 1 time every 3 days, for 4 weeks	VAS[d], JOA[d], muscle strength[d], effective rate[b], 2-month follow up (recurrence rate)[b], safety[d]
Wang X 2019	Central post-stroke pain	Mind regulating and pain suppression acupuncture (4W)	123, no drop off reported	62, (30-32) / (60.45 ± 8.13)	Mind regulating and pain suppression acupuncture, for 4 weeks + Antihypertensive agents + antiplatelet agents+ TENS, 20 min each time, for 4 weeks	61, (32-29) / (59.69 ± 8.09)	Antihypertensive agents + antiplatelet agents+ TENS, 20 min each time, for 4 weeks	Effective rate[d], VAS[c], FMA[c], IL-6[c], TNF-α[c]
Xu H 2015	LDH (T: 6. 93 ± 4. 06M/C: 6. 67 ± 3. 94 M)	Baduanjin (‘…‘«‘®‘µ‘™‘¦) (4W)	16, no drop off reported	8, (5-3) / (48.33 ± 11.25)	Baduanjin, BID, 30 min each time, for 4 weeks + chlorzoxazone, 2 pill, TID, for 4 weeks + diosmin, 2 pill, BID, for 4 weeks	8, (4-4) / (47.87 ± 10.20)	Chlorzoxazone, 2 pill, TID, for 4 weeks + diosmin, 2 pill, BID, for 4 weeks	IL-1β[b], IL-6[b], TNF-α[b], VAS[b], JOA[b]
Xu XX 2018	LDH (T: 24.33 ± 10.8 6M/C: 23.91 ± 10.16 M)	Baduanjin (‘…‘«‘®‘µ‘™‘¦) (4W, 8W, 12W)	90, T: 2- non adherence; C: 2- non adherence	45, (20-25) / (45.27 ± 4.24)	Baduanjin, 30 min each time, 5 times every week, for 12 weeks	45, (21-24) / (44.71 ± 4.42)	Manipulation, BID, 30 min each time, for 22 days	VAS[c], SF-36[c]

Table 2 (*continued*)

Study ID	Disease (course: T; C)	TCM mind body therapy modality (OTP)	Sample size analysed and drop-off reasons	Treatment group		Control group		Outcome indicators
Yang LL 2019	Cervical spondylotic radiculopathy (T: 3 to 42 M/C: 1 to 41 M)	Yijinjing (‘˜“”‘-‘‹’»‘–) (4W)	68, no drop off reported	34, (16-18) / (29-65)	Yijinjing, BID, 10 min each time, for 4 weeks + Nerve block, 0.2% lidocaine 10 ml plus triamcinolone 10 ml, 1 time every week, for 4 weeks	34, (16-18) / (30- 65)	Nerve block, 0.2% lidocaine 10 ml plus triamcinolone 10 ml, 1 time every week, for 4 weeks	VAS[c], JOA[c], 3-month follow up (chordal arc distance of cervical spine[c])
Yuan JL 2019	Cervical spondylotic radiculopathy (T: 44.32 ± 58.92M/C: 38.93 ± 54.05M)	Baduanjin (‘…‘«‘®‘µ‘”’¦) (2W, 12W)	60, no drop off reported	30, (7-23) / (67.53 ± 5.58)	Baduanjin, 40 min each time, 4-5 times every week, for 12 weeks + mecobalamine, 1 pill, TID, for 2 weeks + traction, QD, 15-20 min, for 2 weeks + electroacupuncture plus far infrared therapy, QD, 30 min each time, for 2 weeks + manipulation, QD, 20-30 min each time, for 2 weeks + TENS, QD, 20 min each time, for 2 weeks + ultrashort wave therapy, QD, 15 min, for 2 weeks	30 (9-21) / (67.00±7.18)	Mecobalamine, 1 pill, TID, for 2 weeks + traction, QD, 15-20 min, for 2 weeks + electroacupuncture plus far infrared therapy, QD, 30 min each time, for 2 weeks + manipulation, QD, 20-30 min each time, for 2 weeks + TENS, QD, 20 min each time, for 2 weeks + ultrashort wave therapy, QD, 15 min, for 2 weeks	VAS[c], SAS[c], SDS[c], cervical spine function[c]
Zhang HZ 2020	Cervical spondylotic radiculopathy (T: 2.58 ± 1.91 Y/C: 2.70 ± 1.76Y)	Mind regulating Du channel-unblocking (*通督调神*/tongdu tiaoshen) massage (4W)	60, no drop off reported	30, (13-17) / (55.07 ± 5.45)	Mind regulating Du channel-unblocking massage, QD, for 4 weeks + traction, QD, for 4 weeks	30 (12-18) / (54.43 ± 6.97)	Deanxit, 1 pill, QD, for 4 weeks + traction, QD, for 4 weeks	Effective rate[b], HAMA[c], VAS[c], cervical symptom scale[c]
Zheng HL 2019	LDH (T: 19.52 ± 16.24 M/C: 21.9 ± 22.03)	Qigong (‘°‘”Š‘Ÿ) (12W)	63, T: 1-non adherence; C: 1- non adherence	31, (14-17) / (49.32±10.67)	Qigong relaxation training, QD, 20 min each time, for 12 weeks + Electropuncture, 2 times every week, for 12 weeks	30, (9-21) / (45.1 ± 12.19)	Electropuncture, 2 times every week, for 12 weeks	Effective rate, VAS[c], CODI[a], SAS[c], SDS[a], BST[a], MF[c], 1-month follow up (VAS level)[d]

TCM = traditional Chinese medicine; OTP = observation time point; M ± SD = mean ± standard deviation; T = treatment group; C = control group; W = week; M = month; VAS = visual analogue scale; JOA = Japanese orthopeadic association score; CSSEQ = Cervical Symphathetic Evaluation Questionnaire; NRS = numerical rating scale; NDI = Neck Disability Index; TENS = transcutaneous electric nerve stimulation; CODI = Chinese Version of Oswestry Disability Index; ODI = Oswestry Disability Index; PSQI = Pittsburgh Sleep Quality Index; S100β = central nervous specific protein; NSE = neurone specific enolase; FMA = Fugl-Meyer motor function Assessment; SAS = Self-rating Anxiety Scale; SDS = Self-rating Depression Scale; HAMA = Hamilton Anxiety Scale; BST = Biering-Sorensen Test; MF = media frequency;

[a] The study reported that there was statistical difference before and after the treatments.
[b] The study reported that there was statistical difference between the treatment and the control group.
[c] The study reported that there was statistical difference both before and after the treatments and between the two groups.
[d] There was no statistical difference reported.

All trials measured pain intensity. Other reported outcomes are pain occurrence rate (one trial), physical functioning (16 trials), emotional functioning (three trials), quality of life (two trials), and safety (six trials).

Pain Intensity

All trials measured this outcome. One trial used NRS, while others used VAS (Table 3).

TCM mind-body movement versus physiotherapy

Lumbar herniated disc: Six trials compared TCM mind-body movement with physiotherapy in patients having lumbar herniated discs (Table 3).

The VAS score was used to assess the pain intensity. The two-trial pooled results showed that TCM mind-body movement had a better effect than physiotherapy after 8 weeks of treatment (MD: -0.57, CI: [-0.77, -0.36], $p < .01$, $I^2 = 25\%$). The treatment group also showed advantages over the control group at week 12 (MD: -0.73, CI: [-0.90, -0.56], $p < .01$) in one trial. Three trials that measured the outcome after 4 weeks of treatment showed no significant difference between the two groups (MD: 0.04, CI: [-0.07, 0.15], $p = 0.48$, I^2=66%). Moreover, no significant difference was observed between TCM mind-body movement and physiotherapy after 2 weeks (MD: -0.10, CI: [-0.61, 0.41], $p = 0.7$), and 9 weeks (MD: -0.07, CI: [-0.38, 0.24], $p = .65$) of treatment. Two trials also measured this outcome during follow-up at 3 months (MD: -1.24, CI: [-2.14, -0.34], $p < .01$) and 5 months (MD: -0.05, CI: [-0.50, 0.40], $p = .83$) (Table 3).

TCM mind-body movement versus physiotherapy

Lumbar herniated disc: Nine trials investigated the combination of TCM mind-body movement and physiotherapy or physiotherapy

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Table 3
Summary of Effectiveness on TCM Mind Body Therapies for Patients with Neuropathic Pain

Outcomes and comparisons	Effect estimate [CI] (EST, I^2)	*p*	OTP (sample size)	Study ID
TCM mind-body movement versus physiotherapy				
Lumbar herniated disc				
VAS score	MD: -0.10, [-0.61, 0.41] (0.38)	.70	2W (60)	Chen SQ 2014
	MD: 0.04, [-0.07, 0.15] (0.71, 66%)	.48	4W (210)	Han BL 2015; Li JH 2020; Xu XX 2018
	MD: -0.57, [-0.77, -0.36] (5.36, 25%)	<.01	8W (154)	Pang H 2013; Xu XX 2018
	MD: -0.07, [-0.38, 0.24] (0.45)	.65	9W (60)	Li F 2017
	MD: -0.73, [-0.90, -0.56] (8.21)	<.01	12W (90)	Xu XX 2018;
VAS score (follow-up)	MD: -1.24, [-2.14, -0.34] (2.70)	<.01	3M (57)	Chen SQ 2014
	MD: -0.05, [-0.50, 0.40] (0.22)	.83	5M (60)	Li F 2017
JOA score	MD: 1.55, [0.64, 2.46] (3.34)	<.01	2W (60)	Chen SQ 2014
	MD: 3.42, [0.94, 5.90] (2.71)	<.01	8W (64)	Pang H 2013
ODI score	MD: 2.09, [-0.46, 4.64] (1.61, 56%)	.11	4W (120)	Li JH 2020; Han BL 2015
	MD: 0.06, [-2.98, 3.10] (0.04)	.97	9W (60)	Li F 2017
SF-36 score	MD: 1.15, [-0.03, 2.33] (1.91)	.06	4W (90)	Xu XX 2018
	MD: 5.04, [3.76, 6.32] (7.70)	<.01	8W (90)	Xu XX 2018
	MD: 8.95, [7.76, 10.14] (14.73)	<.01	12W (90)	Xu XX 2018
TCM mind-body movement + physiotherapy versus physiotherapy				
Lumbar herniated disc				
VAS score	MD: -1.02, [-1.12, -0.91] (18.47, 68%)	<.01	4W (180)	Han BL 2015; Ji T 2021; Li JH 2020;
	MD: -0.86, [-1.60, -0.12] (2.28)	.02	20D (57)	Lin HR 2018
	MD: -0.22, [-0.55, 0.11] (1.32)	.19	9W (60)	Li F 2017
	MD: -0.69, [-1.35, -0.03] (2.05)	.04	12W (61)	Zheng HL 2019
	MD: -0.88, [-1.48, -0.28] (2.89)	<.01	6M (68)	Song H 2006
	MD: -1.07, [-1.48, -0.66] (5.10)	<.01	NR (60)	Shang QQ 2014
VAS score (follow-up)	MD: -0.36, [-0.76, 0.04] (1.78)	.07	5M (60)	Li F 2017
JOA score	MD: 2.13, [0.22, 4.04] (2.18)	.03	4W (60)	Ji T 2021;
	MD: 1.70, [0.97, 2.43] (4.55)	<.01	NR (60)	Shang QQ 2014
	MD: 6.96, [4.02, 9.90] (4.64)	<.01	6M (68)	Song H 2006
ODI score	MD: 0.18, [-2.33, 2.68] (0.14, 91%)	.89	4W (120)	Li JH 2020; Han BL 2015
	MD: -5.62, [-8.89, -2.35] (3.36)	<.01	9W (60)	Li F 2017
	MD: -4.63, [-9.73, 0.47] (1.78)	.07	12W (61)	Zheng HL 2019
SAS score	MD: -3.70, [-7.21, -0.19] (2.06)	.04	12W (61)	Zheng HL 2019
SDS score	MD: -3.21, [-6.71, 0.29] (1.80)	.07	12W (61)	Zheng HL 2019
Cervical spondylotic radiculopath				
VAS score	MD: -1.15, [-1.37, -0.94] (19.28, 95%)	<.01	4W (150)	Feng L 2017; Guo H 2020
	MD: -1.33, [-1.53, -1.13] (13.32)	<.01	12W (60)	Guo H 2020
NDI	MD: -4.08, [-4.40, -3.76] (25.22)	<.01	4W (60)	Guo H 2020
	MD: -5.20, [-5.47, -4.93] (37.45)	<.01	12W (60)	Guo H 2020
TCM mind-body movement + chlorzoxazone + diosmin versus chlorzoxazone + diosmin				
Lumbar herniated disc				
VAS score	MD: -0.46, [-1.42, 0.50] (0.94)	.35	4W (16)	Xu H 2015
JOA score	MD: 2.86, [1.40, 4.32] (3.84)	<.01	4W (16)	Xu H 2015
TCM mind-body movement + manipulation vs. Manipulation + neck exercise				
Cervical spondylotic radiculopath				
VAS score	MD: -0.90, [-1.41, -0.39] (3.45)	<.01	4W (86)	Feng L 2017
TCM mind-body movement + celebrex + neck exercise vs. celebrex + neck exercise				
Cervical spondylotic radiculopath				
VAS score	MD: -1.61, [-2.12, -1.10] (6.20)	<.01	16W (60)	Liu DZ 2018
Lovett scale score	MD: 0.87, [0.67, 1.07] (8.40)	<.01	16W (60)	Liu DZ 2018
Cervical motion range	MD: -0.43, [-0.55, -0.31] (7.08)	<.01	16W (60)	Liu DZ 2018
TCM mind-body movement + mecobalamine +physiotherapy vs. mecobalamine + physiotherapy				
Cervical spondylotic radiculopath				
VAS score	MD: 0.03, [-0.39, 0.45] (0.14)	.89	2W (60)	Yuan JL 2019
	MD: -1.57, [-1.94, -1.20] (8.29)	<.01	12W (60)	Yuan JL 2019
SAS score	MD: -2.07, [-5.79, 1.65] (1.09)	.28	2W (60)	Yuan JL 2019
	MD: -9.11, [-13.75, -4.47] (3.85)	<.01	12W (60)	Yuan JL 2019
SDS score	MD: -0.16, [-4.67, 4.35] (0.07)	.94	2W (60)	Yuan JL 2019
	MD: -5.50, [-9.76, -1.24] (2.53)	.01	12W (60)	Yuan JL 2019
Cervical spine function score	MD: 0.10, [-0.92, 1.12] (0.19)	.85	2W (60)	Yuan JL 2019
	MD: 4.90, [4.07, 5.73] (11.55)	<.01	12W (60)	Yuan JL 2019
TCM mind-body massage + traction vs. deanxit+ traction				
Cervical spondylotic radiculopath				
VAS score	MD: -10.67, [-14.27, -7.07] (5.82)	<.01	4W (60)	Zhang HZ 2020
HAMA score	MD: -1.43, [-1.88, -0.98] (6.23)	<.01	4W (60)	Zhang HZ 2020
TCM mind-body movement + nerve block v. nerve block				
Cervical spondylotic radiculopath				
VAS score	MD: -1.35, [-1.87, -0.83] (5.06)	<.01	4W (68)	Yang LL 2019

(*continued on next page*)

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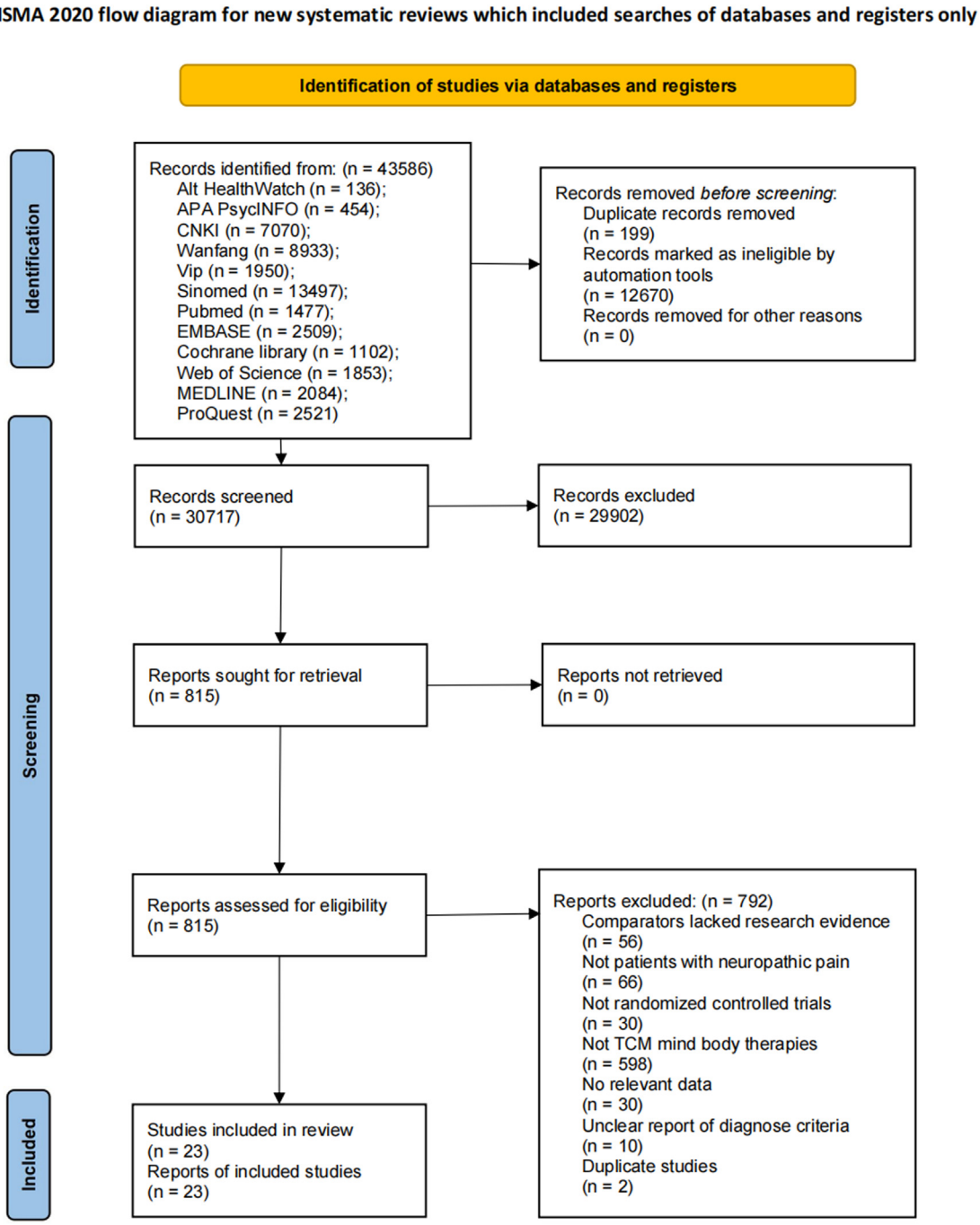

Figure 1. Flow diagram of literature retrieval.

alone for patients with lumbar herniated discs and reported VAS scores (Table 3).

After 20 days (MD: -0.86, CI: [-1.60, -0.12], $p = .02$) (Lin, 2018), 12 weeks (MD: -0.69, CI: [-1.35, -0.03], $p = .04$), 4 weeks (MD: -1.02, CI: [-1.12, -0.91], $p < .01$, $I^2 = 68\%$), and 6 months (MD: -0.88, CI: [-1.48, -0.28], $p < .01$) of treatments, the combined treatment showed a better effect than physiotherapy alone. One trial failed to report a similar observation time point (MD: -1.07, CI: [-1.48, -0.66], $p < .01$). There was no significant difference between the treatment and control groups at week 9 (MD: -0.22, CI: [-0.55, 0.11], $p = .19$) and 5-month follow-up (MD: -0.36, CI: [-0.76, 0.04], $p = .07$). One trial compared physiotherapy alone and reported the median and quartile of VAS scores after 4 weeks of treatment. The treatment group showed a better effect (Table 3).

Cervical spondylotic radiculopath: Two trials assessed TCM mind-body movement combined with physiotherapy versus physiotherapy alone. The pooled VAS score showed that the combined treatment had advantages over physiotherapy after 4 (MD: -1.15, CI: [-1.37, -0.94], $p < .01$, $I^2 = 95\%$) and 12 (MD: -1.33, CI: [-1.53, -1.13], $p < .01$) weeks (Table 3).

TCM mind-body movement + chlorzoxazone + diosmin vs. chlorzoxazone + diosmin

lumbar herniated disc.

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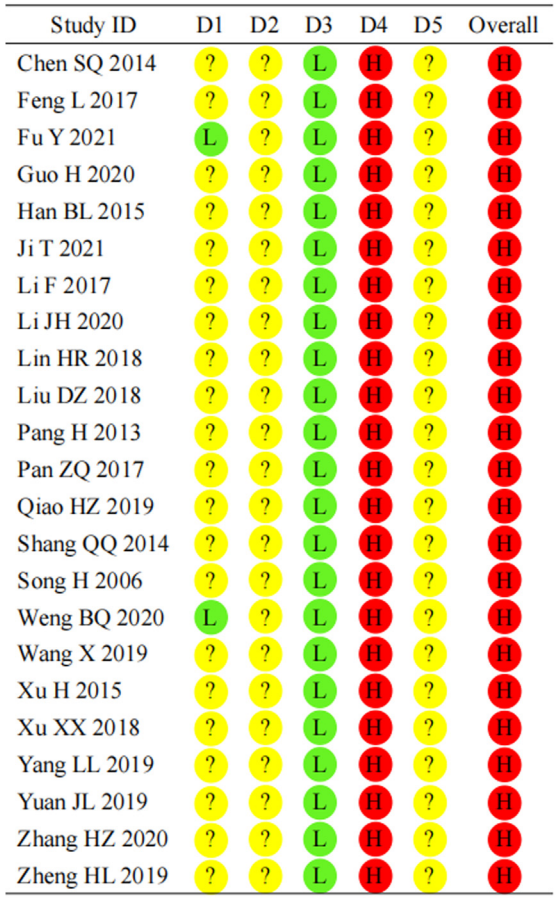

Figure 2. Risk of bias assessment of randomized controlled trials of traditional Chinese medicine mind body therapy for neuropathic pain.

Table 3 (*continued*)

Outcomes and comparisons	Effect estimate [CI] (EST, I^2)	*p*	OTP (sample size)	Study ID
JOA score	MD: -6.46, [-6.93, -5.99] (26.75)	<.01	4W (68)	Yang LL 2019
Aroma massage vs. manipulation				
Sympathetic cervical spondylosis				
NRS	MD: -1.50, [-1.92, -1.08] (6.95)	<.01	12D (86)	Fu Y 2021
NID	MD: -1.00, [-2.06, 0.06] (1.85)	.06	12D (86)	Fu Y 2021
Mind-body acupuncture + carbamazepine vs. carbamazepine				
Trigeminal neuralgia				
VAS score	MD: -0.06, [-0.49, 0.37] (0.27)	.78	4W (61)	Pan ZQ 2017
Pain occurrence rate	MD: -1.93, [-2.94, -0.92] (3.74)	<.01	4W (61)	Pan ZQ 2017
SF-36	MD: 19.05, [11.82, 26.28] (5.16)	<.01	4W (61)	Pan ZQ 2017
VAS score (follow-up)	MD: -1.89, [-2.34, -1.44] (8.28)	<.01	6M (61)	Pan ZQ 2017
Pain occurrence rate (follow-up)	MD: -1.15, [-2.44, 0.14] (1.74)	.08	6M (61)	Pan ZQ 2017
SF-36 (follow-up)	MD: 29.92, [22.96, 36.88] (8.43)	<.01	6M (61)	Pan ZQ 2017
Mind-body acupuncture + gabapentin + pregabalin + TENS vs. gabapentin + pregabalin + TENS				
Central post-stroke pain				
VAS score	MD: -1.43, [-1.75, -1.12] (8.88)	<.01	4W (80)	Qiao HZ 2019
	MD: -1.42, [-1.62, -1.22] (13.93)	<.01	8W (80)	Qiao HZ 2019
Mind-body acupuncture + antihypertensive + antiplatelet agents + TENS vs. antihypertensive + Antiplatelet agents + TENS				
Central post-stroke pain				
VAS score	MD: -1.31, [-1.70, -0.92] (6.50)	<.01	4W (123)	Wang X 2019
FMA	MD: 13.37, [9.47, 17.27] (6.72)	<.01	4W (123)	Wang X 2019

Wang BQ 2021 measured VAS and JOA score and reported median and quartile, hence only narrative analysis are provided.
CI = confidence interval; EST = effect size test; OTP = observation time point; TCM = traditional Chinese medicine; W = week; M = month; D - day; MD = mean difference; VAS = visual analogue scale; JOA = Japanese Orthopeadic Association score; NRS = numerical rating scale; NDI = Neck Disability Index; TENS = transcutaneous electric nerve stimulation; ODI = Oswestry Disability Index; FMA = Fugl-Meyer motor function Assessment; SAS = Self-rating Anxiety Scale; SDS,= Self-rating Depression Scale; HAMA,= Hamilton Anxiety Scale.

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One trial assessed TCM mind-body movement combined with chlorzoxazone and diosmin with chlorzoxazone and diosmin (MD: -0.46, CI: [-1.42, 0.50], $p = .35$) for lumbar herniated discs after 4 weeks of treatment. No significant difference was identified in the VAS score between the two groups (Table 3).

TCM mind-body movement + manipulation vs. Manipulation + neck exercise

cervical spondylotic radiculopath.

One trial compared the VAS score of TCM mind-body movement combined with manipulation and found that it had a better effect than neck exercise combined with manipulation at week 4 (MD: -0.90, CI: [-1.41, -0.39], $p < .01$) (Table 3).

TCM mind-body movement + celebrex + neck exercise vs. celebrex + neck exercise

cervical spondylotic radiculopath.

One trial evaluated TCM mind-body movement combined with celebrex and neck exercise versus celebrex and neck exercise alone. The VAS score at week 16 showed that the treatment group had a better effect than the control group (MD: -1.61, CI: [-2.12, -1.10], $p < .01$) (Table 3).

TCM mind-body movement + mecobalamine + physiotherapy vs. mecobalamine + physiotherapy

Cervical spondylotic radiculopath: One trial compared TCM mind-body movements with mecobalamine and physiotherapy with mecobalamine and physiotherapy alone. The VAS scores indicated that the treatment group had advantages over the control group at week 12 (MD: -1.57, CI: [-1.94, -1.20], $p < .01$); however, there was no significant difference between the two groups at week 2 (MD: 0.03, CI: [-0.39, 0.45], $p = .89$) (Table 3).

TCM mind-body massage + traction vs. deanxit + traction

Cervical spondylotic radiculopath: One trial reported the VAS score at week 4. TCM mind-body massage plus traction showed an effect superior to that of deanxit plus traction (MD: -10.67, CI: [-14.27, -7.07], $p < .01$) (Table 3).

TCM mind-body movement + nerve block versus nerve block

Cervical spondylotic radiculopath: After 4 weeks of treatment, TCM mind-body movement combined with nerve block (MD: -1.35, CI: [-1.87, -0.83], $p < .01$) versus nerve block alone showed advantages on reducing the VAS score (Table 3).

Aroma massage vs. manipulation

Sympathetic cervical spondylosis: One trial used the NRS to measure pain intensity in patients with sympathetic cervical spondylosis. The results showed that aroma massage had a better effect than manipulation after 12 days of treatment (MD: -1.50, CI: [-1.92, -1.08], $p < .01$) (Table 3).

Mind-body acupuncture + carbamazepine versus carbamazepine

Trigeminal neuralgia: One trial reported VAS scores after 4 weeks of treatment and 6 months of follow-up for trigeminal neuralgia. There was no significant difference between the mind-body acupuncture plus carbamazepine group and the carbamazepine alone group at week 4 (MD: -0.06, CI: [-0.49, 0.37], $p = .78$). The score was lower in the treatment group at 6 months (MD: -1.89, CI: [-2.34, -1.44], $p < .01$) (Table 3).

Mind-body acupuncture + gabapentin + pregabalin + TENS versus gabapentin + pregabalin + TENS

Central post-stroke pain: One trial showed that mind-body acupuncture plus abapentin, pregabalin, and TENS had better effects than gabapentin, pregabalin, and TENS at week 4 (MD: -1.43, CI: [-1.75, -1.12], $p < .01$) and week 8 (MD: -1.42, CI: [-1.62, -1.22], $p < .01$) (Table 3).

Mind-body acupuncture + antihypertensive + antiplatelet agents + TENS versus antihypertensive + antiplatelet agents + TENS

Central post-stroke pain: One trial indicated that mind-body acupuncture plus antihypertensive, antiplatelet agents, and TENS had advantages over antihypertensive, antiplatelet agents, and TENS (MD: -1.31, CI: [-1.70, -0.92], $p < .01$) (Table 3).

Pain Occurrence Rate

One trial compared mind-body acupuncture combined with carbamazepine with carbamazepine used alone in patients with trigeminal neuralgia. After 4 weeks of treatment, pain occurrence was reduced more in the treatment group than in the control group (MD: -1.93, CI: [-2.94, -0.92], $p < .01$). There was no significant difference between the two groups at 6 months (MD: -1.15, CI: [-2.44, 0.14], $p = .08$) (Table 3).

Physical Functioning

Sixteen trails reported this outcome. Tools for observation included the Japanese Orthopaedic Association score (JOA), neck disability index (NDI), Oswestry disability index (ODI), Fugl-Meyer motor function assessment (FMA), and cervical spine function score developed by Huaxi Hospital (Table 3).

TCM mind-body movement versus physiotherapy

Lumbar herniated disc: Five trials compared TCM mind-body movement with physiotherapy for lumbar herniated disc patients after 2 (MD: 1.55, CI: [0.64, 2.46], $p < .01$), four (MD: 2.09, CI: [-0.46, 4.64], $p = .11$, $I^2 = 56\%$), eight (MD: 3.42, CI: [0.94, 5.90], $p < .01$), and nine (MD: 0.06, CI: [-2.98, 3.10], $p = .97$) weeks of treatment. Based on the JOA score, the treatment group showed better effects than the control group at weeks 2 and 8. There was no significant difference in the ODI score between the two groups at weeks 4 and 9 (Table 3).

TCM mind-body movement versus physiotherapy

Lumbar herniated disc: Seven trials evaluated TCM mind-body movement and physiotherapy versus physiotherapy alone for patients with lumbar herniated disc. One trial failed to report the observation time (MD: 1.70, CI: [0.97, 2.43], $p < .01$). Others were assessed at week 4 with the JOA score (MD: 2.13, CI: [0.22, 4.04], $p = .03$) and ODI score (MD: 0.18, CI: [-2.33, 2.68], $p = .89$, $I^2 = 91\%$), week 9 with the ODI score (MD: -5.62, [-8.89, -2.35], $p < .01$), week 12 with the ODI score (MD: -4.63, CI: [-9.73, 0.47], $p = .07$), and month 6 with the JOA score (MD: 6.96, CI: [4.02, 9.90], $p < .01$). The results showed that the combination of TCM mind-body movement and physiotherapy had a better effect at week 9 as measured by the ODI, and weeks 4 and 6 by the JOA. One trial compared TCM mind-body movement plus manipulation compared with manipulation alone and assessed the median and quartile of the JOA score and muscle strength after 4 weeks of treatment. The results were favorable in the treatment group (Table 3).

Cervical spondylotic radiculopath: One trial showed that TCM mind-body movement combined with physiotherapy had a better effect than physiotherapy alone on NDI score improvement at

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week 4 (MD: -4.08, CI: [-4.40, -3.76], $p < .01$) and week 12 (MD: -5.20, CI: [-5.47, -4.93], $p < .01$) (Table 3).

TCM mind-body movement + chlorzoxazone + diosmin versus chlorzoxazone + diosmin

lumbar herniated disc.

One trial compared TCM mind-body movement, chlorzoxazone plus diosmin, and chlorzoxazone plus diosmin for patients with lumbar herniated discs. The JOA score demonstrated that the treatment group had advantages over the control group (MD: 2.86, CI: [1.40, 4.32], $p < .01$) (Table 3).

TCM mind-body movement + celebrex + neck exercise versus celebrex + neck exercise

cervical spondylotic radiculopath.

One trial assessed the effect of TCM mind-body movement, celebrex, and neck exercise versus celebrex and neck exercise on the Lovett scale (MD: 0.87, CI: [0.67, 1.07], $p < .01$) and cervical motion range (MD: -0.43, CI: [-0.55, -0.31], $p < .01$) at week 16 (Table 3).

TCM mind-body movement + mecobalamine +physiotherapy versus mecobalamine + physiotherapy

Cervical spondylotic radiculopath: One trial evaluated the combination of TCM mind-body movement, mecobalamine, and physiotherapy compared to mecobalamine and physiotherapy. Cervical spine function scores were measured at week 2 (MD: 0.10, CI: [-0.92, 1.12], $p = .85$) and 12 weeks (MD: 4.90, CI: [4.07, 5.73], $p < .01$). There was no statistically significant difference between the two groups at week 2. The treatment group had an advantage over the control group at week 12 (Table 3).

TCM mind-body movement + nerve block versus nerve block

Cervical spondylotic radiculopath: One trial compared TCM mind-body movement combined with nerve block versus nerve block. The treatment group showed advantages over the control group in terms of the JOA score after 4 weeks of treatment (MD: -6.46, CI: [-6.93, -5.99], $p < .01$) (Table 3).

Aroma massage versus manipulation

Sympathetic cervical spondylosis: One trial compared aroma massage with the manipulation of the NID score (MD: -1.00, CI: [-2.06, 0.06], $p = .06$). There was no statistically significant difference between the two groups after 12 days of treatment (Table 3).

Mind-body acupuncture + antihypertensive + antiplatelet agents + TENS versus antihypertensive + antiplatelet agents + TENS

Central post-stroke pain: One trial reported the FMA scores. The comparison of mind-body acupuncture, antihypertensive, antiplatelet agents, and TENS versus antihypertensive, antiplatelet agents, and TENS produced significant outcomes in the treatment group at week 4 (MD: 13.37, CI: [9.47, 17.27], $p < .01$) (Table 3).

Emotion Functioning

Three trials reported this outcome using self-rating anxiety scale (SAS), self-rating depression scale (SDS), Hamilton anxiety scale (HAMA) (Table 3).

TCM mind-body movement + physiotherapy versus physiotherapy

Lumbar herniated disc: One trial compared TCM mind-body movement and physiotherapy with physiotherapy alone in patients with lumbar herniated discs. The results showed that the treatment group had a better effect than the control group in terms of SAS score (MD: -3.70, CI: [-7.21, -0.19], $p = .04$). The SDS score showed no significant difference between the two groups (MD: -3.21, CI: [-6.71, 0.29], $p = .07$) after 12 weeks of treatment (Table 3).

TCM mind-body movement + mecobalamine +physiotherapy versus mecobalamine + physiotherapy

Cervical spondylotic radiculopath: One trial compared TCM mind-body movements with mecobalamine and physiotherapy versus mecobalamine plus physiotherapy. After 12 weeks of treatment, SAS (MD: -9.11, CI: [-13.75, -4.47], $p < .01$) and SDS (MD: -5.50, CI: [-9.76, -1.24], $p = .01$) score had more improvement in the treatment group than the control group. There was no significant difference between the two groups in both the SAS (MD: -2.07, CI: [-5.79, 1.65], $p = .28$) and SDS scores (MD: -0.16, CI: [-4.67, 4.35], $p = .94$) after 2 weeks of treatment (Table 3).

TCM mind-body massage + traction versus deanxit + traction

Cervical spondylotic radiculopath: One trial measured HAMA scores after 4 weeks of treatment (MD: -1.43, CI: [-1.88, -0.98], $p < .01$). The results showed that TCM mind-body massage with traction had a better effect than deanxit with traction (Table 3).

Physical and Emotion Functioning

Two trials reported these outcomes. The medical outcomes study item short from the health survey (SF-36) was used to measure the quality of life of the participants (Table 3).

TCM mind-body movement versus physiotherapy

Lumbar herniated disc: One trial compared TCM mind-body movement with physiotherapy and observed the SF-36 score at 4-week, 8-week, and 12-week time points. The results indicated a better effect in the TCM mind body movement group at 8 weeks (MD: 5.04, CI: [3.76, 6.32], $p < .01$) and 12 weeks (MD: 8.95, CI: [7.76, 10.14], $p < .01$). There was no statistically significant difference between the two groups at 4 weeks (MD: 1.15, CI: [-0.03, 2.33], $p = .06$) (Table 3).

TCM mind-body movement versus physiotherapy

Trigeminal neuralgia: One trial reported the SF-36 score after four weeks of treatment and 6 months of follow-up. This trial compared mind-body acupuncture with carbamazepine and carbamazepine alone. The acupuncture group showed better effect than the control group (week 4, MD: 19.05, CI: [11.82, 26.28], $p < .01$; month 6, MD: 29.92, CI: [22.96, 36.88], $p < .01$) (Table 3).

Safety

Six trials reported the safety of the used intervention. One trial reported that adverse events, such as nausea, dizziness, fatigue, and pain at the acupuncture point, were observed in the mind regulating acupuncture group. In one trial two patients with cervical spondylotic radiculopathy reported adverse events in the aroma massage group, but the treatment can be continued without any management. One cervical spondylotic radiculopathy patient dropped off because of aggravated dizziness. No evidence was reported that the withdrawal could be related to Baduanjin exercise. The other three trials reported that no adverse events required withdrawal.

Discussion

Summary of Key Findings

The objective of this review was to retrieve comprehensively and evaluate the quality of clinical evidence for assessing the effec-

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tiveness and safety of TCM mind-body therapies in patients with neuropathic pain. Based on the inclusion criteria, a total of 23 RCTs were identified and 1,693 participants with lumbar herniated disc, cervical spondylotic radiculopathy, sympathetic cervical spondylosis, trigeminal neuralgia, and central poststroke pain were included. We could not draw any conclusion because of the high risk of bias in these trials.

Mind-body acupuncture was used to treat trigeminal neuralgia and central poststroke pain. One trial reported its benefits as an adjuvant treatment for patients with trigeminal neuralgia treated with carbamazepine. Two trials combined mind-body acupuncture with medicine and physiotherapy and found that it was more effective than those treatments without mind-body acupuncture.

TCM mind-body massage has been used for cervical spondylotic radiculopathy and sympathetic cervical spondylosis. In one trial, aroma massage was compared with manipulation alone and showed advantages over manipulation in decreasing pain intensity. Another trial reported that TCM mind-body massage was superior to deanxit for treating pain and anxiety.

For patients with lumbar herniated discs and cervical spondylotic radiculopathy, limited evidence indicated that long-term (≥4 weeks) TCM mind-body movement combined with physiotherapy appears to be more beneficial than physiotherapy alone for pain reduction and physical functioning. After the treatment, the effect of pain relief might last for a while and then disappear when TCM mind-body movement is used alone (Chen et al., 2014; Li, 2017). Two trials measured emotional functions and among these, one reported improvement in anxiety after 12 weeks of TCM mind-body movement combined with mecobalamine and physiotherapy. Six trials reported the safety of the intervention used. Adverse events such as nausea, dizziness, fatigue, and pain at the acupuncture point were observed. No severe adverse events such as death, hospitalization, persistent or significant disability, congenital anomaly, or birth defect were observed.

The quality of evidence was low. The two main reasons for raising the risks were obvious differences between the interventions and comparators, and unavoidable self-rated outcomes. Mind-body therapies require the participation of patients themselves, which makes blinding impossible. Awareness of the intervention makes it possible for self-rated outcomes to be affected. Hence, the effectiveness of TCM mind-body therapies has become questionable. None of the included trials reported any information regarding protocol or trial registration and majority of them failed to report the allocation process.

Comparison with Previous Similar Studies and Reviews

One previous systematic review assessed the mind-body therapies for opioid-treated pain and found that mind-body therapies were associated with pain improvement and opioid dosage reduction (Garland et al., 2020). Another Cochrane review investigated acupuncture for neuropathic pain and reported that no definite conclusion could be drawn because of very low-quality evidence and limited data (Ju et al., 2017).

In this review, we observed that TCM mind-body therapies might reduce pain intensity, as evidenced in previous studies. Taking the observation time points into consideration, we made a further assumption on the length of the period of validity of the therapies. However, consistent with the findings of the Cochrane review, the comparisons varied and the quality of the evidence was low. Hence, no definite conclusions were drawn in this review.

Regarding the safety of TCM mind-body therapy, there are systematic reviews that assessed the safety of acupuncture on pain relief. Several of the most commonly mentioned adverse events include pain at the insertion point, hematoma, and bleeding (Mu et al., 2020; Han et al., 2022). Traditional Chinese exercises were reported to have minor adverse events such as nausea, aching muscles, muscle tension, and falls and abrasions (Kong et al., 2022).

In this review, six trials reported adverse events in groups treated with mind-regulating acupuncture, aroma massage, and Baduanjin exercise. The rest of the 17 trials did not measure safety outcomes. The adverse events that occurred in the acupuncture group in one trial were consistent with previous evidence. The patient with cervical spondylotic radiculopathy who withdrew from the Baduanjin trial reported dizziness. No similar event was reported in the study of traditional Chinese exercises in treating neck pain.

Suggestions for Conducting Trials in the Future

RCTs for lumbar herniated discs only used TCM mind-body movement as an intervention. No other TCM mind-body therapies have been tested in RCTs for trigeminal neuralgia and central poststroke pain. It was unclear if this happened because of the small number of trials, authors' experience in different TCM mind-body treatments for different diseases, preferences of patients, different mechanism actions, or others. Therefore, multi-centered RCTs with such comparisons, surveys of practitioners and patients, or preclinical studies are required.

In this review, sixteen trials measured the physical functioning of the participants. The results showed the potential of TCM mind-body therapies for patients' physical improvements (Lumbar herniated disc, cervical spondylotic radiculopath, and central poststroke pain). However, only three low-quality trials reported emotional function. Therefore, future trials can focus more on this aspect along with global judgement of improvement, and satisfaction with treatments as rated by participants. These two outcomes are not only recommended by the IASP, but also valuable items on which the use of TCM mind-body therapies depend (Dworkin et al., 2005).

Currently, the effectiveness of the treatment is not guaranteed, and the course of neuropathic pain usually lasts for a considerably long period. The effectiveness and safety of different treatments, the frequency and duration of effect of TCM mind-body therapies remains unclear. Therefore, different time points will be required to report these factors. Moreover, there is a need to provide protocol registration numbers along with details of randomization and allocation concealment for better quality RCTs.

Limitations

This review had a few limitations. First, the publication bias may exist. We searched a broad range of databases to cover the published and unpublished data as comprehensively as possible. Second, the trials included in this review were not sufficient to prove the safety of TCM mind-body therapies for neuropathic pain. For aroma massage, mind regulating acupuncture, and Wuqinxi(五禽戏), less than 100 patients participated in the studies of each intervention. Third, the risk of bias regarding the selection of the reported results was unclear because insufficient information on registries or protocols. Last but not least, the high heterogeneity of the pooled results affects the generalization of our conclusion, which may be caused by the differences between the interventions, the self-report outcomes such as pain relieving, and the awareness of the intervention by patients.

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Conclusion

The low quality of evidence showed that TCM mind-body therapies might reduce pain intensity and improve physical function when used as complementary therapy or monotherapy. More high-quality trials are needed to confirm the effectiveness and safety of TCM mind-body therapies for neuropathic pain.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.pmn.2022.10.003.

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