Table SI. Characteristics of included studies.

A, Herbs

First author, year	Country of residence	Inclusion criteria	Exclusion criteria	Sample size (% of males)/mean age	Study design	Control	Intervention	Meridian entry	Results	Secondary outcome	(Ref.)
Chrubasik *et al*, 1999	Germany	Aged 18-75 years, chronic susceptibility to lower back pain for ≥6 months and current exacerbation with pain >5 on a 0-10 VAS	Participation in another clinical study within 30 days, serious organic illness, history of drug or alcohol abuse, pregnancy or lactation, known allergy to trial medications and language or cooperation difficulties.	P: 66 (41)/58 years I (H): 66 (44)/59.5 years I (L): 65 (45)/56 years	RCT, double-blind and three parallel arms	Lactose tablets	Groups received 600 mg or 1200 mg Harpagophytum extract or placebo daily for 4 weeks	Gallbladder and Liver	More patients in the Harpagophytum 1200 mg-treated group were pain-free without tramadol for 5 days in the last week compared with the placebo group (P=0.027)	Reduction in tramadol use in both Harpagophytum treatment groups compared to placebo	(37)
Chrubasik *et al*, 2000	Israel	Patients (18-75 years) with chronic lower back pain with pain ≥5 or more on a 0-10 VAS	Serious illness, a history of drug or alcohol abuse, requirement for psychotherapeutic agents, pregnancy, lactation or unreliable contraceptive practice, a known allergy to any of the proposed trial medications, difficulties with language or anticipated cooperation	P: 59 I (H): 67 I (L): 65	RCT, double-blind and three parallel arms	Lactose tablets	Oral willow bark extract or 0.153 mg of salicin per mg of extract twice daily for 4 weeks	Gastric and liver	27 (39%) in the high-dose extract group, 15 (21%) in the low-dose group, and 4 (6%) in the placebo group were pain-free in the final treatment week (P<0.001).	N/A	(30)
Frerick *et al*, 2003	Germany	Aged 18-75 years, with back pain ≥5 or more on an 11-point VAS and back pain	All specific back pain from a defined illness, any systemic inflammatory rheumatic	P: 160 160	I: Randomized parallel-group study and double-blind	Placebo plaster without active substance	22 mg/cm^2 of capsaicin for 3 weeks	Spleen, heart and gastric	Compound pain subscore decreased by 42% (capsicum) and 31% (placebo)	Response criterion was a 30% reduction in the pain subscore from the baseline to final assessment	(7)

		duration ≥3 months at the time of enrolment	condition or other accompanying diseases					compared with the baseline (P=0.002), and the responder rate was 67%	
Chrubasik *et al*, 2010	Germany	Aged 18-65 years, caucasian, chronic soft tissue pain, pain of 5 at enrolment on a VAS scale of 0-10 and able and willing to participate	Severe co-morbidity, addiction to alcohol or drugs, pregnancy or lactation, insufficient contraceptive protection, participation in another clinical trial in the past 4 weeks, concomitant psychiatric disorders, imminent surgical procedure, inability to understand the study's nature, importance and consequences	P: 71 (33.8)/ 48.4±12.1 years I: 71 (35.2)/ 48.1±12.6 years	RCT double-blind	and Cream without active substance	Finalgon® CPD Wärmecreme, 100 g contains 2.2-2.6 g soft extract of Capsici, equivalent to 53 mg capsaicin over 3 weeks	Spleen, heart and gastric	After 3 weeks of treatment, the intervention group showed a 49% reduction in the median pain sum score (P < 0.0001).	Not mentioned	(13)
Pach *et al*, 2011	Germany	Participants aged 30-75 years, male or female participants, participants must have had lower back pain for ≥12 months indicating chronic lower back pain, participants must have	Previous or current treatment with Disci preparations, use of treatments other than NSAIDs or peripherally acting analgesics, routine use of analgesics for other diseases, conditions such as protrusion or prolapsed	P: 48 (43.8)/ 54.8±11.3 years I : 51 (21.6)/ 58.7±10.9 years No I: 51 (43.1)/56.7±10.7 years	RCT, double-blind three parallel arms	and Isotonic saline solution	Each participant received 12 treatment sessions where the first 4 weeks occurred twice per week (at least one day without therapy between sessions) and the second 4 weeks occurred once per week (at least three	Gallbladder, lung, heart, spleen, renal, pericardium and liver	VAS at week 8 showed the intervention group was significantly superior to no treatment (P=0.001), but not to placebo (P=0.350).	Pain intensity at 26 weeks was significantly lower in the intervention group compared to the no-treatment group (P=0.085) but showed no significant difference compared to the placebo group (P=0.837).	(40)

already received standard therapy for lower back pain, average back pain intensity of at least 40 mm on the VAS from 0-100 mm in the last 7 days at baseline, no other treatment except oral NSAIDs and muscle relaxants within 4 weeks prior to study entry, participants must provide informed consent, women of childbearing potential were only included if they used effective contraceptive methods [Pearl Index <1; (54)]	intervertebral discs with neurological symptoms, previous spinal surgery, suspected infectious spondylopathy, back pain due to malignant or infectious disease, organic causes of back pain such as ankylosing spondylitis, Reiter syndrome, Behcet's syndrome, congenital deformities of the spine, suspected osteoporosis with compression fracture, suspected spinal stenosis, spondylolysis or spondylolisthesis and physiotherapy in the last 4 weeks prior or planned during the trial, initiation of new treatment for low back pain or complementary treatment in the last 4 weeks prior or planned during the trial	days without therapy between sessions).

Kong *et al*, 2012	China	Athletes aged 15-35 years, nonspecific lower back pain without ongoing pathologies (disc prolapse, fractures and tumors) and willing to participate and provide informed consent	Other pain syndromes, spinal surgery within the last 6 months, neurological or psychiatric diseases, serious chronic diseases (cardiovascular disease or rheumatoid arthritis), pregnancy or planning a pregnancy, inability to communicate in Chinese	P: 55 (50.9)/ 19.95±3.57 years I: 55 (52.7)/ 21.18±3.77 years	RCT and double-blind	Cream without active substance	Chinese massage with herbal ointment twice weekly for 4 weeks	Gallbladder, lung, heart, spleen, renal, pericardium and liver	Significant improvements in pain (C-SFMPQ scores) and local muscle stiffness in the experimental group compared with the control	The intervention group maintained improvements at the 1-month follow-up, with significant differences in affective scores at the 3-month follow-up, and no adverse events reported. (38)

B, Essential oils

First author, year	Country of residence	Inclusion criteria	Exclusion criteria	Sample size (% of male)/age	Study design	Control	Intervention	Meridian entry	Results	Secondary outcome (Ref.)
Yip *et al*, 2004	Hong Kong	Aged ≥18 years with non-specific sub-lower back pain for most days in the past 4 weeks, no acupuncture, physiotherapy or manipulative therapy in the past week, able to understand the study, complete the interview and follow instructions	Lower back pain caused by specific conditions such as infection, metastases, neoplasm, osteoporosis, fractures, spine deformity or prolapsed intervertebral disc, history of surgery, dislocation, fracture, neurological deficits, spinal disease, varicose veins, blood disorders, cancer or systemic	P: 29 (14)/ 48.1±4.0 years I: 32 (16)/ 43.8±3.0 years	RCT	Usual care only	Acupoint stimulation with electrodes combined with acupressure using lavender essential oil, a total of 8 sessions of relaxation acupoint stimulation followed by acupressure with lavender oil for 3 weeks	Gallbladder, lung and liver	The intervention group showed a significantly greater reduction in VAS pain compared to the placebo group (P=0.0001).	The intervention group demonstrated a significant increase in walking time (P=0.005) and a greater range of lateral spine flexion (P=0.01) compared to the placebo group. (31)

		disorders, pregnancy, allergic to natural lavender oil, wounds at any acupoints on the back or lower limbs or surgical intervention within the last 3 months						
da Silva *et al*, 2010	Brazil	Patients (Over 18 years) were recruited based on spontaneous demand for lumbago treatment within the academic setting	Patients aged <18 years, those not in good physical or mental health, those who did not pass screening, those excluded by physiotherapy diagnoses and pregnant women	P: 10 (30) 10 (30)	I: RCT double-blind	and Placebo gels	Arnica gel (10 g, twice per day) was manually and uniformly applied to the lesion area for 15 days	Lung and liver	The intervention group showed a significantly greater reduction in VAS pain compared to the placebo group (P=0.0001).	Lumbar flexibility measured by a modified Schober method (55). (32)
Sritoomma *et al*, 2014	Thailand	Aged ≥60 years, diagnosed with chronic lower back pain lasting >12 weeks and able to understand and communicate in Thai	Skin disease, inflammation or infection of the back, history of back fracture or surgery, body temperature >38.5˚C on examination day, hemiparesis or paraparesis, infectious diseases (tuberculosis or AIDS), cancer or prior massage within 12 weeks before the study	P: 70 (17.1) I : 70 (22.9)	RCT	TTM	SMGO 30-minute sessions, twice a week for 5 weeks	Lung, spleen, gastric and	1. Both SMGO and TTM significantly reduced pain intensity and improved disability compared to baseline (P<0.05). 2. SMGO was more effective compared with TTM in reducing pain (P=0.044) and improving disability (P=0.042) in both the short-term (6 weeks)	Significant interaction between intervention type and time point for pain intensity and disability scores and the SMGO group showed a greater reduction in pain and disability compared with the TTM group over time (35)

								and long-term (15 weeks).	
Ugurlu *et al*, 2017	Turkey	Aged 20-60 years with lower back pain refractory to physiotherapy and use of NSAIDs	Lumbar surgery, spinal stenosis or deformity (scoliosis, spondylolysis or vertebral fracture sequelae), uncontrolled acute or chronic systemic diseases or atopic skin condition	P: 39 (47.8)/ 42.3±9.59 years I : 40 (51.0) /43.8±10.77 years	RCT and single-blind	Same inactive ingredients in the gel of the intervention group	Artcure diffusional patch containing a mixture of 6 herbal oils: Oleum thymi, oleum limonis, oleum nigra, oleum rosmarini, oleum chamomilla and oleum lauriexpressum for 24 h	Spleen, liver, heart, gastric, renal, gallbladder, colon and lung	In the treatment group, the average VAS value was 9 (range, 3-10) before application and it decreased to 5 (range, 2-10) at the end of first month (P<0.042). The mean ± standard deviation ODI score was 59.2±13.37, reduced to 33.4±10.13 at the end of the first month (P<0.001).	Lasegue's sign, femoral stretching test and paravertebral muscle spasm	(36)
Shirazi *et al*, 2017	Iran	Women aged 18-35 years with uncomplicated pregnancies (12-33 weeks' gestation) who reported lower back pain ≥3 or on a VAS during routine and prenatal care	Patient dissatisfaction, intake of analgesics, moderate or severe allergies to essential oil and pregnancy-related issues	P: 39/28.3±0.6 years I (R): 37/27.7±0.8 years I (A): 38 /27.9±0.7 years	RCT, double-blind and three parallel arms	No intervention	Receive R oil (with carrier oil) or carrier (A) oil, the pregnant women were prescribed 7 drops of oil topically for 100 cm² of the painful area without massage, twice daily for 4 weeks	Spleen and liver	Pain intensity based on VAS score decreased significantly in both the R oil and carrier oil groups (both P<0.001) and the reduction in VAS score was significantly greater in the R oil group compared with the carrier oil group (P<0.001)	The mean RMDQ score in the R oil group decreased by 0.66 points more compared with the carrier oil group (P=0.864).	(34)

Alkanat *et al*, 2023	Turkey	Aged >18 years, had lower back pain for ≥3 months and no disorders impairing communication (hearing, vision, speech or perception problems)	History of allergic skin reactions, fractures or surgery in the lumbar region, body temperature >38.5˚C, cancer treatment or received massage therapy in the last 3 months	P: 30 (46.7)/ 53.87±17.27 years M: 31 (35.5)/ 55.03±14.63 years I: 30 (46.7)/ 48.63±15.70 years	RCT, assessor blind and three parallel arms	Jojoba carrier oil	Applied on weekdays for 3 weeks via lumbar massage with a mixture of 2% frankincense oil and 2% myrrh oil in jojoba carrier oil for 3 weeks	Spleen, liver, heart and lung	The decrease in VAS scores in the aromatherapy group was significantly greater compared with jojoba carrier oil group and the frankincense and myrrh oil in jojoba carrier oil without massage group (P<0.001)	The decrease in scores on the Aberdeen Lower Back Pain Scale (56) (P<0.001) and Roland-Morris Disability Scale (57) (P<0.001) in the aromatherapy group was significantly greater compared with the other groups	(33)
Pérez-Piñero *et al*., 2024	Spain	Healthy men and women aged 20-65 years, episodic persistent myofascial back pain (cervical, dorsal or lumbar areas) with a value of ≥3 on a 1-10 VAS for at least 3 months and a BMI 18.5-29.9 kg/m²	Injury-associated pain, pain caused by chronic conditions (rheumatoid arthritis, herniated disks and ankylosing spondylitis), severe or terminal illnesses, known allergy to any components of the treatment, undergoing physiotherapy treatment during the study, pregnant or lactating women, inability to understand informed consent or the presence of additional requirements such	P: 42/33.1±12.2 years I (H): 42/28.2±10.0 years I: (L): 39/ 31.4±13.4 years	RCT, double-blind, three parallel arms	Composed of 18.2% magnesium stearate, 63.6% microcrystalline cellulose and 18.2% encapsulation with an identical appearance to the investigational product, pre-packed in opaque colored capsule	Berelief®, a botanical blend of 66% ashwagandha root extract, 22% sesame seed extract and 12% rosemary extract and 2 low dose (200 mg/capsule) or high dose (400 mg/capsule) capsules were administered per day for 12 weeks	Spleen, renal, gastric and liver	Pain intensity (VAS scores) showed a statistically significant decrease in all study groups, with a greater reduction in the investigational product groups compared with the placebo, as the low-dose group showed a 56% reduction and the high-dose group showed a 59% reduction compared with the baseline, in addition to a significant reduction in analgesic	Improvements in sleep quality were observed compared with the placebo and low-dose groups, particularly in the high dose group as measured by the Pittsburgh Sleep Quality Index (58) and actigraphy, significant improvements in levels of depression, anxiety and perceived stress in subjects with minimal symptoms at baseline, particularly in the high dose group	(39)

	as avoiding initiating or altering hormonal/medical treatments without justification, abstaining from treatments affecting study parameters, refrain from consuming food supplements and avoiding modifying regular dietary patterns or maintaining consistent physical activity habits throughout the study			medication use observed in the investigational product groups compared with the placebo

A, almond; H, high dose; I, intervention; L, low dose; M, massage; ODI, Oswestry Disability Index; P, placebo; VAS, Visual Analogue Scale; R, rose; RCT, randomized controlled trial; TTM, traditional Thai massage; SMGO, Swedish massage with aromatic ginger oil; N/A, not assessed.

References for Table SI

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