

Lavender Oil



- Available as oral lavender (80 mg softgel) and aromatherapy essential oil
- Helps to relieve restlessness and aids sleep
- May help to relieve pain
- Documented to be metabolized differently than the most common P450 enzymes
- Well tolerated and non-habit-forming
- Non-GMO and organic

Lavender (*Lavandula angustifolia*) has been used, both internally and by olfaction, for centuries as an herbal medicine to promote relaxation, calm the mind, and induce restful sleep. Recently, several high-quality human clinical trials have confirmed the efficacy of oral supplementation with lavender oil at a dose of 80 mg once daily for symptoms of anxiety, comorbid depression, restlessness, agitation, cognitive impairment, and disturbed sleep.^{[1][2][3][4][5][6][7]}

Much clinical research now suggests that oral lavender has equal effect compared to common anxiolytic pharmaceutical drugs used in the treatment of anxiety (paroxetine and lorazepam), without causing sedation, withdrawal symptoms, or any other unsettling side effects.^{[1][4][5]}

The anxiolytic effects of lavender oil have been suggested to be due to the active ingredients linalool and linalyl acetate, which have an ability to modulate GABAergic neurotransmission, thereby inducing a calming effect through general nervous-system inhibition.^[26] This attribute applies to oral, inhalation, and topical routes of administration.

Lavender may be used as a sleep aid, particularly when sleep is disturbed by underlying anxiety. Clinical trials with oral use of lavender oil have shown it to reduce morning tiredness as well as frequency and duration of waking up, while improving sleep quality and overall mood in participants suffering from anxiety, posttraumatic stress disorder, and chronic fatigue.^{[3][7]} Combining lavender-oil aromatherapy, worn as a patch on the chest, along with sleep-hygiene education has been shown to promote sleep quality and quantity.^[8] Diffused lavender-oil aroma nightly has been shown to improve sleep quality as assessed by the Pittsburgh Sleep Quality Index (PSQI) questionnaire in those with insomnia,^[9] as well as time spent in deep sleep.^[10] Lavender essential oil aromatherapy has been shown to reduce stress response, lower resting heart rate, and increase the variability between heartbeats in midlife women with insomnia.^[11] It has also been shown clinically to increase power of *theta* and *alpha* brain activities, induce relaxation, lower blood pressure, and improve cognitive function.^{[12][13][14]} Lavender-and-orange essential-oil aromatherapy in the evening has been shown to improve cognitive function in Alzheimer's and other forms of dementia.^[15]

In a study of 140 women who recently gave birth, their anxiety, stress, and postpartum depression levels were significantly lower when they inhaled three drops of lavender three times daily, after just one month of use.^[16]

Lavender used topically exerts antimicrobial, nervine, antispasmodic, and analgesic properties.

It has been shown to reduce pain and shorten duration in recurrent aphthous ulcers.^[17] Aromatic-oil massage has been used in clinical studies and may alleviate pain of primary dysmenorrhea,^{[18][27]} help to cope with premenstrual syndrome symptoms,^[19] and alleviate acute migraine-related pain^[20] and osteoarthritic knee pain.^[21] Manual acupressure with lavender oil at 3% dilution in a carrier oil for eight sessions over three weeks has been shown to decrease neck-pain intensity, stiffness, range of motion, and stress level in those with nonspecific subacute neck pain.^[22]

Topical use and inhalation of lavender oil have been shown to lower stress and pain intensity associated with needle insertion in hemodialysis patients,^{[23][24]} during chemotherapy treatment^{[28][29]} and in healthy adults.^[25] This may have useful application in reducing pain and anxiety during administration of intravenous therapies. Lavender aroma has also been used to improve postoperative nausea and vomiting^[30] and menopausal hot flashes.^[31]

Diffusing ambient lavender oil may also be used for temporary relief from discontinuing medication for insomnia and reduce withdrawal side effects. In a clinical study on four benzodiazepine-dependent geriatric patients, there was a significant decrease in sleep duration by stopping benzodiazepine treatment, which was restored to previous levels by substitution of aromatherapy with lavender oil.^[32]

Lavender Interactions

Clinical trials suggest that there is a relatively low chance of interactions between lavender oil and certain medications. A randomized, double-blind, crossover trial examining the effect of lavender oil on liver-enzyme induction found that oral use of lavender oil at 160 mg for 11 days had no effect on cytochrome CYP enzymes, which are major pathways for drug activation, metabolism, and elimination: CYP1A2, 2C9, 2D6, and 3A4 activity.^[33] Another clinical trial demonstrated lack of interaction between lavender oil and markers assessing the effectiveness of hormonal contraception.^[34]



Lavender Safety and Adverse Effects

Available evidence suggests that short-term therapy with lavender is relatively safe. In clinical studies, both 160 and 80 mg/d side effects from oral lavender oil were comparable to placebo, and lower than those of the drug paroxetine.^[4] Except for potential mild gastrointestinal symptoms and reflux, supplementation of lavender oil at daily doses of 80 or 160 mg has been shown to be devoid of adverse effects.^[2] There are some reports of adverse effects after topical application of lavender. Gynecomastia coincided with the topical application of products containing lavender and tea tree oils in three boys aged between 7 to 10 years, which resolved shortly after discontinuation of these products. In addition, studies in human cell lines indicated that the lavender oil had estrogenic and antiandrogenic activities.^[35] Lavender should be avoided in those with a known allergy. Ingestion should be avoided during pregnancy (due to emmenagogue effects) and breast-feeding. Lavender oil has low potential for drug abuse or dependency.^{[1][2]}

Table 1. Clinical Studies for Oral Lavender Oil

Indication	Design	Outcomes	Notes
Anxiety	A network meta-analysis of five studies, 524 participants taking oral 80 mg and 121 participants taking oral 160 mg lavender oil were evaluated against other comparators (placebo/paroxetine/lorazepam).	Consumption of 160 mg oral lavender oil resulted in higher decline of HAMA score in comparison to all comparators, except 0.5 mg lorazepam.	[1]
	A review of seven clinical trials using lavender oil at dosage 80 mg/d or 160 mg/d in patients with subsyndromal anxiety or generalized anxiety disorder. Treatment duration was 6–10 weeks.	Supplementation with 80 mg/d lavender oil decreased HAMA scores by 11.3 ±6.7 at six weeks and between 10.8 ±9.6 and 16 ±8.3 at 10 weeks. Anxiolytic effect of lavender oil treatment was evident after 2 weeks.	[2]
	Randomized, double blind, placebo-controlled trial (n = 170). Participants with restlessness and disturbed sleep assigned to 80 mg/d lavender oil (n = 86) or placebo (n = 84) for 10 weeks. Patients with clinical psychiatric or neurological disorders were excluded from study.	Lavender-oil supplementation significantly reduced restlessness and improved sleep as compared to placebo (HAMA score decrease of 11.8 ±7.7 for lavender oil, 9.6 ±8.7 for placebo).	[3]
	Randomized, double-blind, double-dummy trial of 539 adults with generalized anxiety disorder assigned to supplement 160 mg or 80 mg oral lavender oil, 20 mg paroxetine, or placebo once daily for 10 weeks.	HAMA total scores decreased for both dosages as compared to placebo (p < 0.01). A reduction in the HAMA total score by > 50% in 60% of participants in the 160 mg-daily lavender oil group (p < 0.001), 52% in the 80 mg-daily lavender oil group (p < 0.05), 43% in the paroxetine group, and 38% in the placebo group. Lavender oil had a pronounced antidepressant effect at 160 mg dose, significantly improving mental health compared to placebo (p < 0.001). There was no difference on HAMD scores between the lavender oil groups and paroxetine group. Both doses of lavender oil improved quality of life and comorbid depression compared to placebo.	[4]
	Multicentre study compared oral lavender oil (80 mg/d) against a standard benzodiazepine (lorazepam 0.5 mg/d) in 77 adults with generalized anxiety disorder over six weeks. Outcome measured by HAMA score.	Lavender oil and lorazepam decreased HAMA score similarly, by 45% (11.3 ±6.7 points) and 46% (11.6 ±6.6), respectively, from baseline. At the end of the study, 40% of the lavender-oil group and 27% of the lorazepam group were in remission. Lavender oil prolonged total sleep time and reduced the latency to fall asleep and the waking-up duration, effects comparable to that of lorazepam. No daytime sedation was noted with lavender ingestion.	[5]
Depression	A small retrospective case series study of eight participants with major depressive disorder were given 80 mg/d oral lavender oil capsules as adjunctive therapy.	Improvement in sleep-onset and sleep-maintenance insomnia, improvement in depression, and decrease in psychomotor agitation in three of eight participants, compared to no effect in other participants. In six of eight participants, a reduction in major mental depression was observed within three weeks of supplementing lavender oil adjunct to antidepressant therapy. A reduction in restlessness and agitation was reported during the treatment period.	[6]
	Somatization disorder, PTSD, or neurasthenia	An open-label, phase II trial evaluated the effect on subthreshold anxiety of 80 mg of oral lavender oil in 47 participants with somatization disorder, PTSD, or neurasthenia after six weeks. Lavender oil showed 57.4% reduction in depressed mood, 51.1% reduction in sleep disturbances, 61.7% reduction in restlessness, and 44.7% reduction in anxiety during treatment compared to baseline (p < 0.001), as well as significant improvements in cognitive functioning as assessed by the SF-36 mental health assessment (p < 0.001). Waking-up frequency (p = 0.002), waking-up duration (p < 0.001), and morning tiredness (p = 0.005) were reduced, while efficiency of sleep (p = 0.018) and mood (p = 0.03) improved.	[7]

HAMA: Hamilton Anxiety Scale; HAMD: Hamilton Depression Scale

Table 2. Clinical Studies for Lavender Aromatherapy (Inhalation and Topical)

Indication	Design	Outcomes	Notes
Sleep	A double-blind, randomized controlled trial on 79 college students allocated to receive a patch on the chest with 55 µL of lavender essential oil, or a blank patch as a control, for five nights. Both groups also received sleep hygiene education.	The lavender and sleep-hygiene group demonstrated better sleep quality at postintervention (PSQI $p = 0.01$ and PROMIS $p = 0.04$) and at two-week follow up (PSQI $p < 0.001$ and PROMIS $p = 0.007$). At postintervention, the lavender group reported waking feeling refreshed ($p = 0.01$). Sleep quantity did not differ between the groups.	[8]
	Small randomized, single-blind, crossover pilot study on 10 participants with general insomnia, allocated to exposure to diffused lavender oil, 6–8 drops added to a cartridge every night, compared to placebo, for four weeks.	Lavender created an improvement of -2.5 points in PSQI ($p = 0.07$). Women and younger volunteers with milder insomnia improved more than others.	[9]
	A clinical study of 31 (18–30 y.o.) healthy participants received intermittent (first 2 min of each 10 min interval) inhaled lavender oil or a control (distilled water) stimulus in the evening between 23:10 and 23:40, for three consecutive sessions. Standard polysomnographic sleep and self-rated sleepiness and mood data were collected.	Lavender increased the percentage of time spent in deep, restorative slow-wave sleep in both men and women. In women, lavender increased light stage 2 sleep and decreased rapid-eye-movement (REM) sleep. In men, lavender had the opposite effect on these two stages.	[10]
	Cohort, non-placebo-controlled trial in 67 women (45–55 years) with insomnia, using 20 minutes daily of lavender inhalation (0.25 cc in an ultrasonic ionizer aromatherapy diffuser) twice weekly for 12 weeks ($n = 34$). The control group ($n = 33$) received an education program for sleep hygiene, and neither aromatherapy nor placebo.	Reduction in heart rate and increase in heart-rate variability, as well as improvements in sleep quality, were observed.	[11]
Relaxation	Clinical trial involving 40 adults given three minutes of either lavender or rosemary aromatherapy (10% dilution). Participants were given math computations before and after the therapy. EEG activity, alertness, and mood were assessed.	The lavender group showed increased <i>beta</i> power, suggesting increased drowsiness, less depressed mood, and feeling of relaxation. They performed math computations faster and more accurately following aromatherapy.	[12]
Relaxation and blood pressure	Double-blind clinical trial of 20 adults assigned to inhale 10% dilution lavender oil, against almond oil as placebo. CNS and mood responses were assessed after inhalation. Scalp EEG was recorded to measure brain wave activity.	Lavender inhalation showed reductions in systolic and diastolic blood pressure, respiratory rate, and body temperature, as well as improvements in a relaxed mental state (self reports of relax, good, active, and fresh). EEG showed increases in power of <i>theta</i> (4–8 Hz) and <i>alpha</i> (8–13 Hz) brain activities.	[13]
Mood	Clinical trial in 10 (23 ±3 years old) healthy women exposed to lavender aroma. Brain activity was measured using PET and ECG before and after 10, 20, and 30 minutes of aromatherapy.	Lavender aromatherapy increased both brain arousal, parasympathetic tone, and feelings of relaxation.	[14]
Cognition	Controlled clinical trial ($n = 28$) in patients with various forms of dementia and Alzheimer's patients ($n = 17$). Aromatherapy treatment: Essential oils placed on a piece of gauze in diffusers with an electric fan. Rosemary and lemon essential oils in the morning, and lavender and orange in the evening. After a control period of 28 days, aromatherapy was performed over the following 28 days, with a washout period of another 28 days.	All patients showed significant improvement in cognitive function. Alzheimer's patients showed significant improvement in total Touch Panel-type Dementia Assessment Scale scores. There were no side effects reported.	[15]
Postpartum stress, anxiety, and depression	Randomized clinical trial in 140 women divided into aromatherapy group (three drops of lavender oil rubbed into palm of the hand and inhaled every 8 h daily) and control group immediately after giving birth for one month.	Stress, anxiety, and depression at time point of two weeks ($p = 0.012$, $p < 0.0001$, and $p = 0.003$, respectively) and stress, anxiety, and depression scores at time points of one month ($p < 0.0001$) and three months after delivery ($p < 0.0001$) were significantly lower in the study group compared with the control group.	[16]
Recurrent aphthous ulceration	Randomized, double-blind, placebo-controlled study of 115 adults with recurrent aphthous ulcers used topical lavender oil for three days. The clinical efficacy was assessed by inflammation level, erythema, edema, ulcer duration, ulcer size, mean area under the curve of ulcer area, healing time, and associated pain intensity and reduction.	Lavender oil showed a significant reduction in inflammation level, ulcer size, and healing time, from 2–4 days (2 days 40%, 3 days 50%, 4 days 10%), and pain relief mostly from the first dose, compared to baseline and placebo. No side effects were reported.	[17]
Dysmenorrhea	Double-blind clinical trial on 44 women with dysmenorrhea assigned to massage with lavender oil compared to placebo. Every participant applied both lavender and placebo massage; either 2 mL of essential oil applied to hands, then followed by a 15-minute massage, or odourless liquid petrolatum as placebo. The study used a quasi-experimental design with the subjects as their own control. Pain was evaluated using VAS rating scale.	Pain associated with menstruation was reduced by 38% with lavender oil massage relative to only 9.8% in placebo massage. Note that the trial was blinded, but the aroma did not appear to be controlled (so topical or aroma mechanisms not yet known).	[18]
Premenstrual syndrome	Randomized, controlled trial in 77 students with premenstrual syndrome, using lavender oil aroma. Five sessions during each menstrual cycle, for three cycles. Data was collected by questionnaire form and PMS scale.	Inhalation of lavender oil significantly improved PMS scores ($p < 0.05$) and subdimensions of anxiety, depression, affect, nervousness, pain, bloating, and depressive thoughts when compared between pretest and third follow-up ($p < 0.05$). It was concluded that inhalation aromatherapy can be used for coping with premenstrual syndrome.	[19]
Acute migraine	Placebo-controlled clinical trial on acute management of migraine headaches ($n = 47$) using 15 minutes of 2–3 drops of lavender essential oil applied onto the upper lip. Control was liquid paraffin. Headache pain severity recorded using visual analogue scale.	Significant reduction of headache pain, 3.6 ±2.8 compared to control ($p < 0.0001$). Percentage of responders was significantly higher in the lavender than the placebo group ($p < 0.001$).	[20]

Arthritic pain	Single-blinded, randomized clinical trial on 90 elderly with osteoarthritis of the knee. Randomly assigned to three groups: Intervention (aromatherapy massage with lavender essential oil), placebo (massage with almond oil), and control (without massage). The participants were evaluated for pain via visual analogue scale at baseline, immediately after the intervention, one week, and four weeks after the intervention.	Pain severity in the intervention group was significantly different immediately and one week after the intervention compared with their initial status ($p < 0.001$) and that of the control group ($p < 0.001$ and $p = 0.009$ respectively). However, at four weeks after the intervention, there was no significant difference in pain severity between the groups ($p = 0.67$).	[21]
Neck pain	A randomized controlled trial on 32 adults with nonspecific subacute neck pain allocated to receive a course of eight sessions of manual acupressure with 3% lavender oil, over three weeks.	One month after treatment, the manual acupressure group had 23% reduced pain intensity ($p = 0.02$), 23% reduced neck stiffness ($p = 0.001$), 39% reduced stress level ($p = 0.0001$), improved neck flexion ($p = 0.02$), neck lateral flexion ($p = 0.02$), and neck extension ($p = 0.01$), compared to control. However, improvements in functional disability level were found in both the manual acupressure group ($p = 0.001$) and control group ($p = 0.02$).	[22]
Vascular access	A randomized controlled study on 60 hemodialysis patients. Lavender oil inhalation in 1:10 dilution ratio in sweet almond oil was applied during vascular access.	The mean pain score of the intervention group was 3.8 ± 0.3 prior to the application of lavender oil inhalation and decreased to 3.0 ± 0.2 following the inhalation application, whereas the pain mean score of the control group increased from 5.4 ± 0.3 to 5.6 ± 0.6 . Applying lavender-oil inhalation decreases pain during vascular access and caused no negative effects.	[23]
Pain during needle insertion	Open crossover study on 34 hemodialysis patients. Lavender oil applied topically to the needle insertion area. Intensity of pain was measured in three different states: 1) The topical application of 100% lavender essential oil, 2) no intervention, and 3) placebo (with water).	The mean pain \pm SD intensity was 2.91 ± 1.69 with the topical application of lavender, 4.59 ± 2.02 in the no-intervention state, and 4.18 ± 1.66 with the placebo state. ($p = 0.001$).	[24]
	Randomized controlled trial of 30 healthy participants allocated to receive needle injection. Two groups: Oxygen mask coated with lavender oil, and control with mask with no lavender oil, for five minutes. Stress level and pain were measured on a 0–10 scale.	Stress level, the bispectral index (a promising parameter for monitoring sedation), and pain intensity of needle insertion were significantly reduced after receiving oxygen with a face mask coated with lavender oil ($p < 0.001$).	[25]

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Each softgel contains:

Organic lavender (*Lavandula angustifolia*) essential oil 80 mg
Also contains: Organic olive oil and natural vitamin E (D-alpha-tocopherol) from (non-GMO sunflower) in a softgel composed of annatto extract (in sunflower oil), bovine gelatin, glycerin, and purified water.
Directions of use: Adults: Take 1 softgel daily with food and a full glass of water or as directed by your health-care practitioner.

Each drop contains:

Organic lavender (*Lavandula angustifolia*) flowering herb top essential oil 100%
Active compounds: Linalyl acetate and linalool.
Directions of use: Adults: Mix with vegetable oil for topical application. Use undiluted for direct or steam inhalation. Use diluted for baths. Not for oral use. Avoid contact with eyes and mucous membranes; if this happens, rinse thoroughly with vegetable oil. For occasional use only.

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