

Efficacy, Safety and Tolerability of Aroma Massage with Lavender Essential Oil: an Overview

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INTRODUCTION

In the pursuit of wellbeing, relaxation, and health, mankind has resorted to massage since prehistoric times.⁽¹⁾ The term “massage”, probably derived from the Greek word “massein” (to knead), today indicates a wide range of therapeutic or relaxing techniques which uses body manipulation, alone or in combination with herbs, water, salts, and muds.⁽¹⁾ Aromatherapy massage (shortened to “aroma massage”) or massage with essential oils that are plant-derived oily substances with volatile and fragrant properties,⁽²⁾ has been practiced for many years too, mostly by diluting essential oils into a massage carrier oil or diffusing them in the environment during the treatment.⁽³⁾

In particular, among essential oils derived from plants with sedative and calming properties, lavender has always been known in traditional medicine as a remedy which helps to achieve psychophysical relaxation. Evidence from in vitro and in vivo laboratory studies indicates that lavender essential oil, whose main bioactive components are linalool and linalyl acetate, can interact with several neuropharmacological targets, including the serotonin transporter and the MAO-A, GABA-A, and NMDA ionotropic receptors, thus exerting a central anxiolytic, antidepressive, and relaxing action.⁽³⁾ From a pharmacokinetic point of view, the two main bioactive compounds (linalool and linalyl acetate) of lavender essential oil administered through massage are absorbed both through inhalation and through skin penetration. Their blood concentrations can be detectable 5 minutes after the massage, they tend to peak after 20 minutes, and they are usually eliminated within 90 minutes after the end of the treatment.⁽⁴⁾

In general, aromatherapy massage is quite popular as a relaxing technique and

has been reported to be one of the most commonly used complementary therapy in the UK.⁽⁵⁾ However, evidence on its efficacy is not fully clear to date, and some reports have cast doubts on its clinical safety.⁽⁶⁾ The aim of the present work is to outline the efficacy, safety, and tolerability profile of aromatherapy massage with topically applied lavender essential oil, based on a critical overview of available scientific evidence on the topic.

EFFICACY OF AROMA MASSAGE WITH LAVENDER OIL

Psychological Disturbances

The quantitative findings of a recently published systematic review and meta-analysis underscore the potential efficacy of massage with lavender essential oil in the reduction of anxiety levels, with a significant result in favor of intervention (Hedges' $g = -0.66$ [95% CI -0.97 to -0.35], $p < .0001$, 448 participants) after pooling data from six randomized controlled trials.⁽³⁾ The main limitations of this result was the low average quality of evidence from included studies mostly due to the inherent difficulty in blinding this type of research, and the presence of confounding factors, which didn't allow to quantify the exact contribution to the observed anxiolytic effect of each component of the treatment (body manipulation, lavender essential oil inhalation and skin absorption, useful placebo effects like the rituality of the treatment).⁽³⁾ However, considering that lavender essential oil administered orally has a significant effect on anxiety levels⁽³⁾ and that, after massage, its bioactive compounds (linalool and linalyl acetate) can also be detected into the subject's bloodstream,⁽⁴⁾ it is plausible to assume that a useful anxiolytic and relaxing

pharmacological role of this essential oil in aroma massage exists beyond the sole action of other treatment components.

Clinical trials involving elderly patients affected by cardiovascular diseases underscore the activity of aromatherapy massage with lavender essential oil not only for anxiety, but also for depression, mood status, and sleep quality.^(7,8) Results of another controlled study also report beneficial effects of lavender aromatherapy hand massage on emotional status and aggressive behavior in subjects with dementia,⁽⁹⁾ thus highlighting, along with evidence from the previously mentioned trials, an interesting role of this intervention for elderly individuals with an impaired quality of life due to typical age-related diseases.

With regard to early-life health conditions, in a pilot study involving 12 children affected by autism, aroma massage with lavender oil didn't result in any significant amelioration of their sleep pattern and quality.⁽¹⁰⁾ In this case, although the very limited number of recruited patients might have biased study results, further investigation is needed to assure the real effect of aroma massage with lavender oil in pediatric patients with neurodevelopmental disorders.

Pain-related Benign Disorders

As demonstrated by a meta-analytical work, aromatherapy can prove useful for pain management in adjunct to conventional therapies.⁽¹¹⁾ In particular, evidence from a clinical trial involving 90 patients with knee osteoarthritis indicates the beneficial effect of massage with lavender essential oil in terms of pain and functional status, if compared to massage with a more inert substance like almond oil.⁽¹²⁾ Results of two trials involving 32 patients with non-specific subacute cervical pain and 61 patients with lumbar pain, respectively, suggest that eight sessions of manual acupressure with lavender oil can significantly reduce pain and improve spine mobility.⁽¹³⁾

Other pain-related conditions for which lavender aroma massage appears to be significantly beneficial with regard to their symptomatic management are infantile colic,⁽¹⁴⁾ dysmenorrhea,⁽¹⁵⁾ and labor-induced pain.⁽¹⁶⁾ In another study, a significant decrease in pain intensity has been experienced by a cohort of 118 elderly patients with chronic pain of various non-malignant origin when treated with

lavender aromatherapy hand massage.⁽¹⁷⁾ Moreover, massage with lavender oil has been demonstrated to be useful, along with routine treatment, for symptomatic relief of 70 patients with restless leg syndrome due to chronic kidney failure.⁽¹⁸⁾

Overall, aromatherapy massage with lavender essential oil appears useful for symptomatic improvements of benign health conditions characterized by chronic or subacute pain and impaired quality of life. It is interesting to notice that evidence obtained from a randomized controlled trial underscores that lavender aroma massage can provide a significant additional benefit if compared with massage alone in the symptomatic amelioration of musculoskeletal pain due to osteoarthritis.⁽¹²⁾ The potential role of lavender aroma massage in pain control of gynecological or pediatric conditions must be taken into account, given that such intervention could be useful to limit the administration of common painkillers and, therefore, the incidence of adverse events in these categories of patients. In general, it is plausible to hypothesize that the analgesic action of lavender application follows its systemic absorption and may be due to its role as a sedative compound with relaxing and anti-nociceptive properties.^(3,13)

Advanced Incurable Life-Limiting Illnesses (Palliative Care)

A recently published systematic review has explored the potential role of aroma massage in palliative care of cancer patients, and data from five included studies suggest that aromatherapy, reflexology, and massage, as well as building a supportive relationship with the therapist who delivers such treatments, can enhance the subjects' well-being and may help them to cope psychologically with the individual disease burden.⁽¹⁹⁾ In the same work, it is also highlighted that, although the level of evidence for the clinical efficacy of aromatherapy and massage in cancer palliative care may not be high, such interventions are generally safe, and they are subjectively regarded as valuable and beneficial for quality of life by patients involved in qualitative studies.⁽¹⁹⁾ In a previously published *Cochrane Systematic Review* on the same topic, similar conclusions were drawn by the authors, thus suggesting that aromatherapy massage can exert some short-term benefits on cancer

patients' psychological well-being.⁽⁵⁾ Nevertheless, it is reported that it is unclear whether, in this specific health condition, aromatherapy can significantly enhance the sole effect of body manipulation.⁽⁵⁾ Results of a study with 100 hospitalized patients (50% of whom receiving artificial ventilation) treated for severe conditions in an intensive care unit suggest that foot massage with lavender oil may be capable of improving several physiological parameters on a short term, including blood pressure, heart rate, respiratory rate, wakefulness, and pain.⁽¹³⁾ In a study involving 42 cancer patients residing in a hospice setting, although no long-term benefits were demonstrated, massage with lavender aromatherapy improved the subjects' sleep quality on a short-term, but no significant additional beneficial effect was in general found for the combination of aromatherapy with massage if compared to massage alone.⁽²⁰⁾

Different reasons can be hypothesized to explain these results characterized by weak evidence in support of aroma massage, especially if compared to massage alone, including: (a) the high level of heterogeneity and risk of bias within and across studies included in existing reviews, (b) the limited sample size recruited in each relevant trial, (c) the lack of adequate qualitative outcome measurements, and (d) the potentially less pronounced sedative, analgesic, and relaxing action of lavender oil in such patients. Nevertheless, considering the nature of intervention (easy to administer and generally safe) and all potential short-term benefits for quality of life of patients with incurable diseases, it may be worthwhile to investigate the topic more in depth in order to better define the magnitude of any useful effect.

Summary and Future Perspectives

Overall, as reported by the above mentioned studies, aroma massage with lavender essential oil may be beneficial as a complementary and integrative therapy for several health conditions including anxiety, depression, behavioral symptoms of dementia, restless leg syndrome, knee osteoarthritis, and non-specific back pain, as well as pain of non-malignant origin, infantile colic, dysmenorrhea, labor-related symptoms, and impaired well-being in cancer patients. All these heterogeneous conditions can be briefly summarized into

three main categories sharing common major features and characteristics:

- Psychological disturbances;
- Pain-related benign disorders; and
- Advanced incurable life-limiting illnesses (palliative care).

In general, improvements especially are observed in terms of symptomatic management, pain control, mood status, quality of life, and psychophysical relaxation. Moreover, aromatherapy massage with lavender essential oil appears to be more beneficial (and to add a significant additional effect beyond the action of massage alone) in non-severe health conditions and on a relatively short term, rather than in patients with a severe impairment of their general health status. Interesting results have been observed not only in adults, but also in elderly subjects with common age-related cardiovascular or neurological comorbidities. In some cases, instead of total body massage, more localized manipulations like hand massage or foot reflexology in combination with lavender aromatherapy may be already sufficient to exert some beneficial effects of this intervention. However, due to the lack of high quality and adequately powered studies, further investigations are needed before conclusions can be drawn on the topic. Additionally, designing ad hoc trials with more adequate outcome measurements could be useful in order to better quantify the exact general improvement of patients who undergo complementary therapies like aroma massage, since several authors have observed a gap between quantitative results obtained within trials and the positive amelioration of subjective well-being as reported by involved patients in qualitative studies.^(19,20)

SAFETY AND TOLERABILITY OF AROMA MASSAGE WITH LAVENDER OIL

Overall Safety and Tolerability Profile

Aroma massage shares the same contraindications of other body manipulation techniques, along with precautions that must be taken when handling and externally applying essential oils.

All essential oils, regardless of the plant they are extracted from, should be carefully administered when topically applied,

and any contact with irritated or damaged skin must be avoided.⁽²⁾ Particular attention should be paid to subjects with a past history of contact skin allergies (lavender aroma massage must be avoided in subjects who are allergic to lavender) and, in general, with allergic diathesis and skin irritability.⁽¹³⁾ When externally applied, essential oils should be adequately diluted at a concentration of 1.5%–3.0% in a carrier oil.⁽²⁾ If the contact also involves the subject's face, the dilution should be augmented to 0.2%–1.5% in order to prevent adverse reactions on the more sensitive face skin.⁽²⁾ Contact or inhalation exposure to large amounts of oils are to be avoided too, because of potential triggering of seizures and bronchospastic episodes in predisposed individuals; as well, excessively long exposures should be avoided in order to prevent hypersensitivity phenomena.⁽²⁾

Evidence from trials investigating the use of all lavender-based interventions (inhalation, oral administration, and aroma massage) for anxiety and relaxation suggests that safety data are poorly reported or not reported at all by most study authors. However, based on available information, lavender administration can generally be considered as safe, with only non-severe and reversible side effects mainly reported for oral consumption of encapsulated essential oil.⁽³⁾ In the scientific literature, a highly discussed and controversial report describes the case of three prepubertal male subjects (aged 7 to 10 years old) who, after local applications of products containing both lavender and tea tree oils, developed gynecomastia, which resolved after discontinuation of intervention.⁽⁶⁾ Further studies are needed to better investigate the safety profile of lavender in pediatric patients. Caution is also advised in pregnant women due to lack of safety data and unknown risk to the fetus. Moreover, strict controls by local health authorities should prevent the production and marketing of natural remedies contaminated by endocrine disruptors and toxic substances, or adulterated for commercial purposes, to guarantee the best quality standards for consumers.

Summary and Future Perspectives

Existing evidence substantially outlines a good safety profile of lavender aroma massage, which appears to be well tolerated by patients when all general precautions are

followed. However, more attention should be paid by future trial investigators in describing all adverse events experienced by participants during the study period and in the follow-up after intervention, in order to avoid any under-report of safety data.

CONCLUSIONS

Aroma massage with lavender essential oil may be beneficial as a complementary and integrative therapy for the symptomatic management of various conditions, mainly psychological disturbances and pain-related benign disorders, and possibly, in palliative care of advanced incurable life-limiting illnesses. Some evidence interestingly underscores significant additional benefits when aroma massage is compared with massage alone, especially in the help of anxiety management and benign musculoskeletal pain control. In general, studied intervention appears safe and well tolerated by patients, provided that all precautions are followed by therapists. Further studies on the topic are encouraged to understand better the therapeutic properties of lavender aroma massage, especially in the pediatric population for whom available efficacy and safety data are scarce and controversial.

Like for other CAM-based (Complementary and Alternative Medicines) interventions, evidence is not sufficient to draw definitive conclusions on their efficacy, nor to suggest their systematic adoption in clinical practice. The present overview on the topic supports the usefulness and safety of lavender aroma massage in the above-listed conditions, and, when patients look for it, they are not to be discouraged. However, available evidence doesn't allow to affirm with certainty that this intervention is significantly more effective than massage alone and, to date, since the potential additional benefits remain unquantified, lavender aroma massage cannot be actively recommended to patients. Further randomized clinical trials ought preliminarily to assess the efficacy of lavender when topically applied and transcutaneously absorbed without massage, possibly adopting a condition like anxiety as a testing ground. Then, if significant benefits are observed, it would be possible to assume that lavender aroma massage is superior to massage alone, thus justifying future attempts to quantify precisely these effects in dedicated trials.

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