



THERAPEUTIC USE OF LAVENDER OIL

D. Popova-Dobrev*^{*}

Department of TMKT, Faculty of Public Health, Health Care and Tourism,
National Sports Academy “Vassil Levski”, Sofia, Bulgaria

ABSTRACT

PURPOSE To establish the scientific directions of lavender oil research and its therapeutic use. **METHODS** An analysis was made of the available methodological literature in the medical database PubMed related to Lavender oil. Known empirical therapeutic uses of lavender oil are Relaxation and stress relief. Lavender oil is known for its calming properties, which can help promote relaxation and reduce stress and anxiety; Pain relief: Lavender oil has analgesic properties, which means it can help relieve pain. Skincare: Lavender oil has antiseptic and anti-inflammatory properties, which can help soothe and heal minor skin irritations like acne, insect bites, and minor burns; Respiratory support: Digestive health: Lavender oil may also help support digestive health by reducing inflammation in the gut and promoting healthy digestion. **RESULTS** 501 scientific studies with Lavender oil were found in the medical database PubMed. This publication analyzes the directions of scientific studies. **CONCLUSIONS** Lavender oil is a popular essential oil that has been used for centuries for its therapeutic properties. A significant part of scientific research is aimed at proving empirically known therapeutic applications.

Key words: PubMed, lavender oil, scientific studies

INTRODUCTION

The lavender essential oil contains over 100 different components, primarily terpenoid, and phenolic compounds (1). *Lavandula angustifolia* Mill. oil exhibits various pharmacological activities, including healing, sedative, antidepressant, antiseptic, antifungal, relaxing, and antiemetic properties. Studies have shown that it is generally safe with minimal risk of toxicity. The monoterpenes present in lavender oil, such as limonene and perillyl alcohol, have strong anti-cancer activity. Additionally, lavender oil's antibacterial properties are attributed to the phenolic compounds carvacrol, eugenol, and thymol, and certain terpenes have shown potential in preventing cardiovascular diseases. Due to its therapeutic applications and potential, lavender is gaining prominence in the healthcare field for improving the quality of life

and well-being of individuals. It offers positive experiences and promotes health. As a result, there is growing interest in scientific research to understand lavender's mechanism of action on human health (2).

METHODS

A thorough analysis was conducted on the existing methodological literature in the medical database PubMed regarding Lavender oil. The purpose of this analysis was to gather and examine the available information and studies related to Lavender oil.

RESULTS

Upon searching the medical database PubMed, a total of 501 scientific studies related to Lavender oil were identified. The publication at hand aims to analyze and explore the various directions and focus areas of these scientific studies. The goal is to provide insights into the specific areas of research that have been explored in relation to Lavender oil. By identifying the research trends, the publication offers insights into the diverse range of topics and potential benefits associated with the use of Lavender oil.

^{*}**Correspondence to:** *Diana Popova-Dobrev*
Department of TMKT, Faculty of Public Health,
Health Care and Tourism, National Sports
Academy “Vassil Levski”, Sofia, Stud. Grad,
dobrev_da@yahoo.coml, +359 895505550

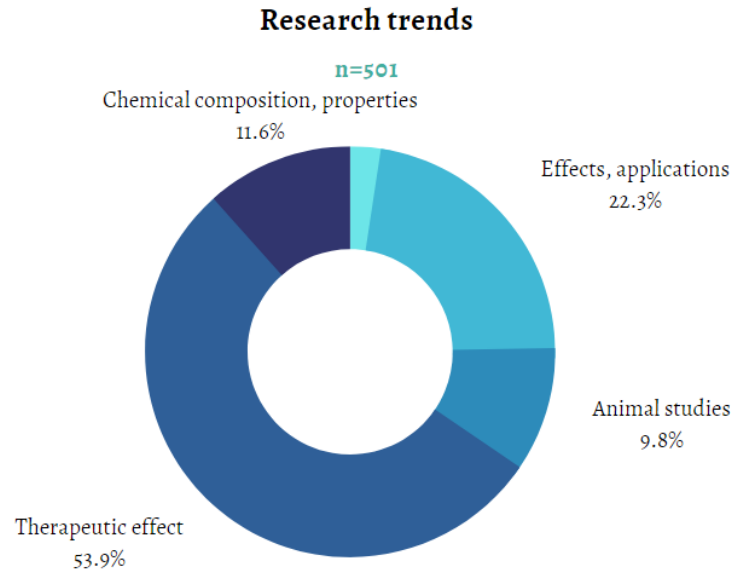


Figure 1. Research trends.

Among the analyzed studies on Lavender oil in the medical database PubMed, the majority (53.9%) focused on investigating its therapeutic effects. This indicates a significant interest in understanding how the application of lavender essential oil can be beneficial in various contexts. Additionally, 22.3% of the studies explored different uses of lavender oil and examined the effects associated with its application. A smaller portion of the studies (11.6%) delved into researching the characteristic properties of the oil and

measuring various indicators related to its composition and efficacy. Animal studies accounted for 9.8% of the total number of studies, indicating a subset of research specifically conducted on animals. Lastly, 2.4% of the studies covered diverse themes that did not fit into the aforementioned categories. Overall, these findings provide an overview of the distribution of research directions in the scientific studies on Lavender oil within the PubMed database.

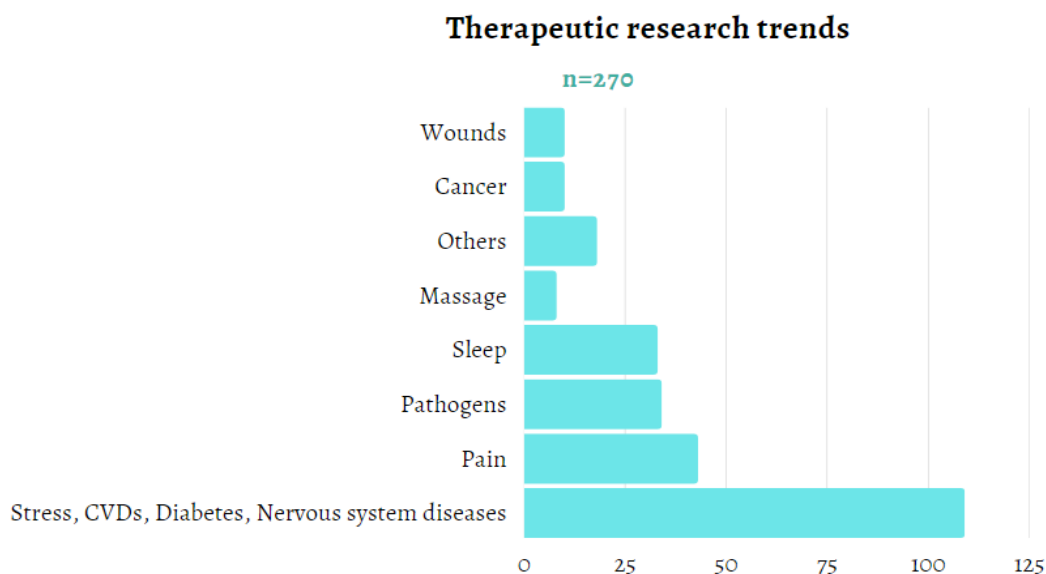


Figure 2. Therapeutic research trends.

Among the studies related to the therapeutic effects of lavender essential oil, the largest number of studies focus on its potential for the prevention and treatment of cardiovascular diseases, diabetes, nervous diseases, and stress-related effects, with a total of 101 studies. Within this group, there is a notable emphasis on anxiety, with 30 studies specifically addressing this area. Additionally, other studies explore the effects of lavender oil on stress, blood pressure, dementia, cardiovascular disease, psoriasis, and various other conditions. This distribution of research highlights the significant interest in understanding the potential benefits of lavender essential oil in managing and improving various health conditions, particularly in relation to stress and anxiety.

Koehler T. aims to explore the potential clinical applications of lavender aromatherapy as a complementary intervention for preoperative anxiety, alongside standard preoperative care. The study design involved a comparison of anxiety levels before and after the administration of lavender aromatherapy using a visual analog scale (VAS). A total of 44 surgical patients participated, including 29 females and 15 males. The participants were asked to rate their anxiety levels on the VAS before receiving a lavender aromatherapy inhaler. Subsequently, anxiety scores were measured again after the administration of lavender aromatherapy, shortly before the participants left the preoperative area for surgery. A pre-post comparison of the anxiety measurements was performed and analyzed. Among the female participants, 48% reported a decrease in anxiety after receiving lavender aromatherapy in the preoperative period. It was observed that female participants had higher preoperative anxiety scores and experienced a larger decrease in mean anxiety scores after receiving lavender aromatherapy compared to male participants. In conclusion, the use of nurse-driven complementary interventions in the preoperative area was associated with a decrease in mean anxiety scores among female patients who were about to undergo elective surgery (3).

Arslan, I. et al. assess the effects of lavender oil inhalation on psychological and physiological outcomes in children undergoing tooth extraction. A total of 126 children aged 6 to 12 years were divided into two groups: the

lavender group and the control group. The lavender group inhaled 100% lavender oil for 3 minutes before the dental procedures, while the control group received no prior application. Psychological assessments were conducted using the face image scale (FIS), Face, Legs, Activity, Cry, Consolability (FLACC) scale, and Wong-Baker pain rating scale (WBS). Physiological changes were measured by evaluating vital signs. Measurements were taken before the applications, after inhalation, anesthesia injection, and tooth extraction. The study found that the lavender group exhibited significantly lower anxiety and pain scores after tooth extraction compared to the control group ($p < 0.05$). In addition, the lavender group showed significantly lower blood pressure levels and a significant decrease in pulse rate after inhalation. Conversely, the control group experienced a significant increase in heart rate after anesthesia injection and tooth extraction ($p < 0.05$).

Based on these findings, the study concludes that lavender oil can be considered as a preferred treatment option in routine pediatric dentistry. The use of aromatherapy with lavender oil helps reduce anxiety levels and facilitates dental procedures for children (4).

There are 43 studies dedicated to exploring the application of lavender essential oil in the presence of different types of pain. These studies specifically focus on pain conditions such as headaches, childbirth, episiotomy (a surgical cut during childbirth), infantile colic, and more. The research within this area aims to understand the potential of lavender essential oil in providing relief and managing pain associated with these specific conditions. The existence of these studies suggests a growing interest in using lavender essential oil as a complementary approach to alleviate pain and improve the well-being of individuals experiencing various types of discomfort.

Karatopuk, S., & Yarıcı, F. conducted a randomized controlled trial involving pregnant women and aimed to evaluate the effects of lavender essence inhalation and lavender essence massage on labor pain. The participants were divided into three groups: a control group, a lavender essence inhalation group, and a lavender essence massage group. The interventions were administered in three phases of labor: early, active, and transition. In the

lavender essence massage group, participants received a 15-minute sacral compression and circular massage using two drops of lavender oil on their lower back. In the lavender essence inhalation group, two drops of lavender oil were placed on the participant's palms, and they were instructed to inhale it for three minutes. Data were collected using a Personal Information Form, Visual Analogue Scale, and Postpartum Assessment of Women Survey.

The results showed that women who received inhalation and massage therapy using lavender essential oil reported milder labor pain compared to the control group ($p < 0.05$). Additionally, it was found that lavender oil inhalation had the best results in the latent phase of labor, while massage therapy with lavender oil was more effective in the active and transition phases. Based on these findings, the study concluded that both inhalation and massage therapy with lavender essential oil contributed to the alleviation of labor pain. The researchers recommended that midwives consider incorporating massage therapy and inhalation applications with lavender oil as complementary methods to manage labor pain during delivery (5).

In this double-blind randomized clinical trial Sahebkar, Z. et al. focused on infants who met certain inclusion criteria, such as being healthy, not taking any medications for colic, experiencing at least two hours of crying per day, and having a healthy mother. The intervention group received lavender oil inhalation, while the control group received sweet almond oil inhalation, both for a duration of seven days. The duration of crying episodes was collected four times a day through telephone contact, and the mothers' mood scores were assessed at the beginning of the study and on the seventh day of the intervention.

In conclusion, the study found that inhaling lavender oil at low concentrations could effectively reduce colic symptoms in infants and improve the mood of their mothers. These findings highlight the potential benefits of lavender oil inhalation as a non-pharmacological approach to managing colic in infants (6).

The effects of lavender oil on various pathogens have been studied in 34 studies. Essential oils have been recognized for their potent antiseptic properties. Roller, S. et al., evaluated the

antibacterial activity of four chemically characterized essential oils obtained from *Lavandula angustifolia*, *L. latifolia*, *L. stoechas*, and a necrodane-rich *L. luisieri*. The assessment was conducted using the disc diffusion method. Based on these findings, the study suggests that further investigation should be conducted on combinations of lavender oils for potential use in antibacterial products. This highlights the potential of utilizing different lavender oil combinations to enhance their antibacterial effectiveness, opening possibilities for the development of new antibacterial treatments (7).

Among the reviewed studies, thirty-three of them specifically investigated the effects of lavender oil on sleep parameters and quality. Kavurmacı, M. et al. employed an intervention and control group design, with pretest and posttest assessments. The intervention group received aromatherapy treatment with lavender oil for one week. The findings of the study indicated that the posttest scores for the Pittsburgh Sleep Quality Index and the Checklist Individual Strength in the intervention group were significantly lower than those of the control group. This suggests that the students who received the lavender oil intervention experienced improved sleep quality and reduced fatigue compared to the control group (8).

In a double-blind randomized controlled trial Oshvandi, K., et al. aimed to investigate the effects of foot massage with lavender and orange essential oil on sleep quality and restless leg syndrome (RLS) in hemodialysis (HD) patients. A total of 105 HD patients participated in the study, with random allocation into three groups: lavender group, orange group, and control group.

The intervention involved foot massage with lavender and orange essential oil administered three times a week for three weeks during HD sessions, with each massage lasting 30 minutes. The control group received routine care. Before the intervention and at the end of each week, the Pittsburgh Sleep Quality Index (PSQI) and RLS questionnaire were completed by all three groups. Statistical analysis was conducted using an Independent Samples t-test, chi-square test, and repeated-measures analysis of variance (ANOVA).

The results showed that the mean scores of sleep quality and RLS in the intervention groups (lavender and orange) were significantly different compared to the control group at all three data collection points. In conclusion, foot massage with lavender and orange essential oil can be considered a non-pharmacological treatment option to enhance sleep quality and alleviate RLS symptoms in HD patients (9).

Additionally, ten studies were dedicated to exploring the therapeutic potential of lavender oil in the healing of difficult-to-heal skin wounds.

This study conducted by Sofi, H. S. et al. explores the use of synthetic polymers with biocompatible and biodegradable properties as effective alternatives for the treatment of severe wounds and burn injuries. The ideal wound-dressing material should minimize pain, promote quick healing, and guide the growth of defect-free epidermal cells. Additionally, it should possess hydrophilic properties and establish direct contact with the damaged tissue while exhibiting antibacterial properties. To address these requirements, the study introduces a novel technique for producing composite electrospun nanofibers using polyurethane, lavender oil, and silver nanoparticles (Ag NPs) (10).

Moreover, lavender oil was found to be used in palliative treatment for various types of cancer in ten studies.

Fahmy, M. A et al. analyze the chemical constituents of *Lavandula officinalis* essential oil (LAEO) using GC/MS analysis and investigate its genotoxicity, anti-genotoxicity, and histopathological activities against the chemotherapeutic drug cyclophosphamide (CP). Additionally, the study aimed to evaluate the anticancer effects of LAEO on six human cancer cell lines.

The researchers conducted various assays to assess genotoxicity, including the micronucleus, chromosomal aberration, and comet assays. They also performed a histopathological study focused on the liver. The experimental groups consisted of negative control, a control group treated with the plant extract, a positive control group treated with CP, and three combined groups that received different concentrations of LAEO along with

CP. In conclusion, *Lavandula officinalis* essential oil demonstrated anticancer and anti-mutagenic effects. The findings suggest its potential as a therapeutic agent in the treatment of cancer, particularly for hepatocellular carcinoma and lung carcinoma (11).

Apart from these areas, eighteen studies focused on the different therapeutic effects of lavender oil, including its impact on hair loss, endocrine diseases, vomiting, lower limb pain, premenstrual syndrome, constipation, and more. Furthermore, six of these studies also examined the influence of lavender oil on the overall quality of life.

Aydinli, A. et al. investigated the effects of aromatherapy massage on constipation in elderly individuals residing in a nursing home. A total of 40 elderly individuals participated in the study, with half assigned to the intervention group and the other half to the control group. The intervention group received 15 minutes of aromatherapy massage for five weekdays per week over a four-week period, while no intervention was administered to the control group.

The results showed that, initially, there were no significant differences in the Bristol Stool Chart and Constipation Severity Scale scores between the intervention and control groups of elderly individuals ($p > 0.05$). However, in the second and fourth weeks after the aromatherapy massage application, there was a significant increase in the Bristol Stool Chart scores and a significant decrease in the Constipation Severity Scale scores in the intervention group compared to the control group ($p < 0.05$). The study suggests that aromatherapy massage can be an effective intervention for managing constipation in elderly individuals (12).

This comprehensive range of research demonstrates the growing interest in the diverse therapeutic applications of lavender oil and its potential in improving various health conditions and well-being.

CONCLUSION

The conducted research reflects the keen interest of researchers in the therapeutic applications of lavender. Specifically, the utilization of lavender oil for the prevention and treatment of stress-related conditions and excessive strain serves as a foundation for

establishing beneficial practices within Bulgarian wellness practices, with the aim of promoting health and well-being. This highlights the recognition of lavender's potential in enhancing overall wellness and underscores the importance of incorporating it into the health-promoting practices of the Bulgarian wellness culture.

REFERENCES

- Sharma, L., Meghna, C., Ajmera, P. Health benefits of lavender (*Lavandula angustifolia*), *Int. J. Physiol., Nutr. Phys. Educ.* 4 (1) (2019) 1274–1277.
- de Melo Alves Silva, L. C., de Oliveira Mendes, F. C., de Castro Teixeira, F., de Lima Fernandes, T. E., Barros Ribeiro, K. R., da Silva Leal, K. C., Dantas, D. V., & Neves Dantas, R. A. (2023). Use of *Lavandula angustifolia* essential oil as a complementary therapy in adult health care: A scoping review. *Heliyon*, 9(5), e15446. <https://doi.org/10.1016/j.heliyon.2023.e15446>
- Koehler T. (2021). Lavender Aromatherapy as a Nurse-Driven Intervention for Preoperative Anxiety. *Nursing for women's health*, 25(4), 286–295. <https://doi.org/10.1016/j.nwh.2021.05.005>
- Arslan, I., Aydinoglu, S., & Karan, N. B. (2020). Can lavender oil inhalation help to overcome dental anxiety and pain in children? A randomized clinical trial. *European journal of pediatrics*, 179(6), 985–992. <https://doi.org/10.1007/s00431-020-03595-7>
- Karatopuk, S., & Yarıcı, F. (2023). Determining the effect of inhalation and lavender essential oil massage therapy on the severity of perceived labor pain in primiparous women: A randomized controlled trial. *Explore (New York, N.Y.)*, 19(1), 107–114. <https://doi.org/10.1016/j.explore.2022.08.006>
- Sahebkar, Z., Bahrami, R., Azima, S., & Akbarzadeh, M. (2022). Efficacy of Aromatherapy for Night Crying in Infants with Infantile Colic: A Double-Blind Randomized Controlled Trial. *International journal of preventive medicine*, 13, 159. https://doi.org/10.4103/ijpvm.IJPVM_538_20
- Roller, S., Ernest, N., & Buckle, J. (2009). The antimicrobial activity of high-necrodane and other lavender oils on methicillin-sensitive and -resistant *Staphylococcus aureus* (MSSA and MRSA). *Journal of alternative and complementary medicine (New York, N.Y.)*, 15(3), 275–279. <https://doi.org/10.1089/acm.2008.0268>
- Kavurmacı, M., Sariaslan, A., & Yıldız, İ. (2022). Determination the effects of lavender oil quality of sleep and fatigue of students. *Perspectives in psychiatric care*, 58(3), 1013–1020. <https://doi.org/10.1111/ppc.12892>
- Oshvandi, K., Mirzajani Letomi, F., Soltanian, A. R., & Shamsizadeh, M. (2021). The effects of foot massage on hemodialysis patients' sleep quality and restless leg syndrome: a comparison of lavender and sweet orange essential oil topical application. *Journal of complementary & integrative medicine*, 18(4), 843–850. <https://doi.org/10.1515/jcim-2020-0121>
- Sofi, H. S., Akram, T., Tamboli, A. H., Majeed, A., Shabir, N., & Sheikh, F. A. (2019). Novel lavender oil and silver nanoparticles simultaneously loaded onto polyurethane nanofibers for wound-healing applications. *International journal of pharmaceutics*, 569, 118590. <https://doi.org/10.1016/j.ijpharm.2019.118590>
- Fahmy, M. A., Farghaly, A. A., Hassan, E. E., Hassan, E. M., Hassan, Z. M., Mahmoud, K., & Omara, E. A. (2022). Evaluation of the Anti-Cancer/Anti-Mutagenic Efficiency of *Lavandula officinalis* Essential Oil. *Asian Pacific journal of cancer prevention : APJCP*, 23(4), 1215–1222. <https://doi.org/10.31557/APJCP.2022.23.4.1215>
- Aydinli, A., & Karadağ, S. (2023). "Effects of abdominal massage applied with ginger and lavender oil for elderly with constipation: A randomized controlled trial". *Explore (New York, N.Y.)*, 19(1), 115–120. <https://doi.org/10.1016/j.explore.2022.08.010>