



# Some implications of using aromatherapy as complementary method in oncology setting

Renata Martinec

## SUMMARY

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University of Zagreb, Faculty of Education and Rehabilitation Sciences, Department of Motoric Disturbances, Chronic Disease and Art-Therapies, Zagreb, Croatia

Correspondence to: Renata Martinec, University of Zagreb, Faculty of Education and Rehabilitation Sciences, Department of Motoric Disturbances, Chronic Disease and Art-Therapies, Borongajska 83f, 10 000 Zagreb, Croatia

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## INTRODUCTION

Aromatherapy is, according to definition of International Federation of Professional Aromatherapists – IFPA (established in 2002 in Leicestershire – UK), the controlled use of essential oils by different methods to enhance the well-being of the mind, body and spirit. It uses pure essences from plants which have a therapeutic effect in preventing problems, treating common ailments and working alongside medical treatment in the healing process<sup>1</sup>. Essential oils are extracted from flowers, leaves, twigs, bark, roots and fruits of many common plants. From an organic chemist's point of view, the active constituents of essential oils are composed of hydrocarbons and oxygenated hydrocarbons which can be grouped according to their molecular structure into terpenes, esters, alcohols, aldehydes, ketones, and phenols (1). Essential oils have many kinds of pharmacologic actions including anti-microbial, sedative, analgesic, spasmolytic and estrogen or steroid hormone-like effects, etc. (2, 3). Aromatherapy also affects the central nervous system, relieving depression and anxiety, reducing stress, relaxing, sedating or stimulating, and restoring both physical and emotional well-being (4-7).

When inhaled, various aromas penetrate the bloodstream via the lungs causing physiologic changes (2). Also, active constituents of essential oils stimulate, through the olfactory system, different parts of limbic system (hypothalamus, hippocampus, amygdalae...). In that way, indirectly, endocrine glands, autonomic nervous system, mood, memory and emotional reactions are stimulated (8). Aromatherapy also could have positive influence on different organs' systems through topical absorption (through the skin pores) by using aromatherapy massage, baths, compresses, salves, etc.

The practice of aromatherapy is reputed to be at least 6,000 years old. Using of essential oils within ritualistic, religious, cosmetic and therapeutic purpose is described in numerous ancient civilizations, as well in Arabian, Ayurvedic and Chinese traditional medicine (9). The term „aromatherapie” was coined by a French chemist named René-Maurice Gattefossé (1881-1950) who studied the medicinal properties of essential

oils for many years. His work was followed by Dr. Jean Valnet (1920-1995) who continued to use essential oils to treat illnesses, and was the first ever to use them to treat psychiatric conditions. It was the beginning of use of essential oils in clinical and scientific conditions.

Within 20<sup>th</sup> century, aromatherapy has become one of the improved complementary methods used with prophylactic or therapeutic purpose (10). In some countries, aromatherapy is incorporated into mainstream medicine. For example, in Australia, essential oils are classified and regulated under the same policies as conventional medicines such as the National Medicines Policy and the Quality Use of Medicines (QUM) (11). In some countries (e.g. in France), within the frame of aromatic medicine, application of essential oils includes oral and internal use. That means that the specialists, on the basis of the aromatogram, decide which essential oil has the best effect against the targeted strain of microorganism (8). Education in the field of clinical aromatherapy is provided on the graduated or post graduated level. For example, at the University of Wolverhampton in Great Britain, aromatherapy is studied under the study program on complementary therapies, or at Napier University in Edinburgh under the module named Complementary Healthcare (Aromatherapy). Also there is a one-year education program at the Australasian College of Natural Therapies in Sidney, or 390-hour program at the Essential Oil Therapy Training and Certification at The College of Botanical Healing Arts, Santa Cruz, USA. Effectiveness of using aromatherapy in rehabilitation and clinical conditions is also studied at the Faculty of Education and Rehabilitation Sciences University of Zagreb under the graduate program module Rehabilitation, Sofrology, Creative and Art/Expressive Therapies.

## CLINICAL AROMATHERAPY

Impacts of the use of essential oils in clinical conditions became an issue of a number of scientific investigations in which a biochemical and psychological parameters were tested. The results of these investigations are published in different scientific journals that refer to psychophysiology, complementary therapies, somatotherapy, holistic medicine, etc. Some of these journals are: *Complementary Therapies in Clinical Practice*; *Complementary Therapies in Nursing and Midwifery*; *Journal*

renata.martinec@zg.t-com.hr

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<sup>1</sup> International Federation of Professional Aromatherapists (IFPA), www.ifparoma.org

of Bodywork and Movement Therapies; Evidence-based Complementary and Alternative Medicine; Biochemical Systematics and Ecology, etc. There are also specialized scientific publications such as the International Journal of Essential Oil Therapeutics and The International Journal of Clinical Aromatherapy published by Essential Oil Resource Consultants (EORC) – providers of research, information and education in the field of essential oils.

Clinical evidence of aromatherapy effectiveness is growing and different results showed that application of essential oils could be used in the field of: anxiety, depression, stress, insomnia, pain, muscular aches, headaches, circulation, digestive problems, menstrual and menopausal problems (8, 11-14). Some investigations have proved that some essential oils (thyme, lavender, lemon, chamomile, bergamot, patchouli, etc.) may impact the immune function at a cellular level (15). According to Pénoël (16) the effects of phenols could be compared to those of human immunoglobulin M (IgM).

Since various kinds of essential oils such as true lavender, rose, mandarin, sweet orange, sandalwood, geranium, etc. have the anxiolytic effect, aromatherapy has been used for the relief of depression and anxiety (3). It means that aromatherapy also has the ability to affect the emotions, feelings, help bodily symptoms and work psychologically (17, 18). For example, Abuhamdah and Chazot (19) have suggested: „There is growing evidence that essential oils have useful properties in relieving emotional disorders, particularly those seen in neurodegenerative diseases”.

Stimulation of limbic system is the reason why using of essential oils influence not only physiological reactions but also emotions, memories, imaginations and aesthetic experience (20, 21). According to Steflitsch, Steflitsch (8): „Familiar smells associated with happy memories can help re-establish feelings of happiness and reduce stress... Certain essential oils, such as lavender, rose, neroli and petitgrain, are well known for this ability.”

Although the prophylactic and therapeutic characteristics of essential oils are proved, it is suggested that each intervention will have to be specifically designed including clinical picture and selection of the most appropriate essential oil or combination of oils based on chemical and pharmacological criteria (22). Further investigations are also required to minimize the negative influence of common problems of confounding factors and of inferring causality in the real-world situations, e.g., due to expectations, placebo, measurement error, small number of patients and the limitations of double-blind procedures (23).

## AROMATHERAPY IN ONCOLOGY SETTINGS

Aromatherapy as a part of complementary therapies could be used to enhance the quality of life of pediatric or adult cancer patients (24-27). For example, Post-White (24) described the results of a pilot study conducted at the Children's Hospital and Clinics in Minnesota, which tested the effectiveness of 3 types of aromatherapy essential oils on nausea and vomiting during, and for 3 days after receiving emetogenic chemotherapy. In a crossover randomized design, the children selected 1 essential oil: spearmint (*Mentha spicata*), peppermint (*Mentha piperita*), or ginger (*Zingiber officinale*) to use during 1 cycle of their highly or moderately emetogenic chemotherapy. Children used the essential oil 7 to 26 times

per day, with the mean dose ranging from 10.7 to 18.8 times per day. Antiemetics are given throughout the chemotherapy cycle, with identical agents given in both cycles. Preliminary analysis of 13 participants suggested that peppermint or spearmint essential oil (most commonly chosen) could be effective in reducing the self-reported nausea levels in a completed sample. Although not significant and inconclusive with a small sample, the mean scores of self-reported nausea were all higher during the control period than during the intervention with the essential oil. Six out of 7 children were receiving 24-hour antiemetic infusions, and the incidence of vomiting was low in both arms.

Aromatherapy massage is one of the most popular complementary therapies among patients with cancer and the most widely practiced one within cancer care settings (28-30). According to the Society for Oncology Massage (S4OM) oncology massage is defined as „The adaptation of massage to safely nurture body, mind and spirit of anyone who is dealing with cancer.” Society for Oncology Massage, organized in Maine, USA, since 2007 is an international association of massage therapists with the particular interest, specialized training and extraordinary compassion to safely bring the healing powers of massage to oncology patients at all stages of the cancer journey<sup>2</sup>. An oncology massage therapist needs to consider the full spectrum of cancer-related issues: the physical consequences of cancer, the side effects of various treatments, the psychosocial and emotional consequences. Aromatherapy massage had proved to relieve self-reported symptoms of anxiety in the immediate aftermath of the therapy, and patients perceive aromatherapy massage as positive and beneficial (31, 32).

Kite et al. (33) described the results of investigation conducted at the Aromatherapy Service at the Cancer Support and Information Centre (CSIC) that has been continually assessed since its inception in 1993. The Hospital Anxiety and Depression Scale (HADS) was completed before and after a course of six aromatherapy sessions. The majority of 58 patients were female with breast cancer and were receiving radical oncological treatment. There were significant improvements in HADS scores. Fifty per cent or more of the sample reported a significant improvement in the eight most commonly assessed symptoms. The authors concluded that aromatherapy massage has a role in reducing psychological distress, and improving symptom control in cancer patients.

Wilkinson (34), in one investigation, tested the effectiveness of supplementing the usual supportive care with aromatherapy massage in the management of anxiety and depression in cancer patients through a pragmatic two-arm randomized controlled trial in four United Kingdom cancer centers and a hospice. The number of 288 cancer patients with clinical anxiety and/or depression, were allocated randomly to a course of aromatherapy massage or usual supportive care alone. The patients in the aromatherapy massage arm received a 4-week course of weekly, 1-hour sessions of aromatherapy massage. A treatment protocol for the aromatherapy massage included 20 essential oils and different massage techniques. The majority of participants were female, and more than half had breast cancer. Nearly half of the participants had advanced cancer, and two thirds were undergoing chemotherapy and/or radiotherapy during

<sup>2</sup> Society for Oncology Massage (S4OM), www.s4om.org

the trial. The patients who received aromatherapy massage had no significant improvement in clinical anxiety and/or depression compared to those receiving the usual care at 10 weeks postrandomization, but did at 6 weeks postrandomization. The patients receiving aromatherapy massage also described greater improvement in self-reported anxiety at both 6 and 10 weeks postrandomization, respectively.

The use of complementary therapies, such as aromatherapy massage, is also rising in popularity in a palliative care setting due to positive effect on mood, physical symptoms, pain and quality of life (35-38). For example, Wilkinson et al. (39) studied 103 patients under palliative care, who were randomly allocated to receive massage using a carrier oil (massage) or massage using a carrier oil plus the Roman chamomile essential oil (aromatherapy massage). The outcome measurements included the Rotterdam Symptom Checklist (RSCL), the State-Trait Anxiety Inventory (STAI) and a semi-structured questionnaire, administered 2 weeks post-massage, to explore the patients' perceptions of the massage. There was a statistically significant reduction in anxiety after each massage on the STAI, and improved scores on the RSCL: psychological, quality of life, severe physical and severe psychological subscales for the combined aromatherapy and massage group. The aromatherapy group's scores improved on all RSCL subscales at the 1% level of significance or better, except for severely restricted activities. The addition of an essential oil seems to enhance the effect of the massage and to improve physical and psychological symptoms, as well as the overall quality of life.

Also, according to the results of some investigations (8) there is a list of the isolates that are thought to have anticarcinogenic properties (Table 1).

**Table 1. Isolates thought to have anticarcinogenic properties**

	Isolate	Source	Botanical name	
1	Sclareol	Clary sage	<i>Salvia sclarea</i>	Dimas et al. (40)
2	Bergamottin	Bergamot	<i>Citrus bergamia</i>	Miyake et al. (41)
		Peppermint	<i>Mentha piperita</i>	
3	Perillyl alcohol	Spearmint	<i>Mentha spicata</i>	Bellanger (42)
		Lavandin	<i>Lavandula intermedia</i>	
4	D-limonene, geraniol	Lemongrass	<i>Cymbopogon citratus</i>	Zheng et al. (43)
5	Carvone, anethufuran, limonene	Dill	<i>Anethum graveolens</i>	Zheng et al. (44)
		Caraway	<i>Carum carvi</i>	

Those findings are related to results of some other authors that evaluated influence of aromatherapy on different immunological parameters. For example, Kuriyama et al. (7) in their preliminary investigation compares peripheral blood cell counts including red blood cells (RBCs), white blood cells (WBCs), neutrophils, peripheral blood lymphocytes (PBLs), CD4<sup>+</sup>, CD8<sup>+</sup> and CD16<sup>+</sup> lymphocytes, CD4<sup>+</sup>/CD8<sup>+</sup> ratio, hematocrit, humoral parameters including serum interferon- $\gamma$  and interleukin-6, salivary secretory immunoglobulin A (IgA). Psychological measures included the State-Trait Anxiety Inventory (STAI) questionnaire and the Self-rating Depression Scale (SDS) among the recipients (n = 11) of carrier oil massage and aromatherapy massage, which includes sweet almond oil, lavender oil, cypress oil and sweet marjoram oil. Though both STAI and SDS showed a significant reduction ( $P < 0.01$ ) after the treatment with aromatherapy and carrier massage, no difference between the aromatherapy

and control massage was observed for STAI and SDS. However, aromatherapy massage showed a significant ( $P > 0.05$ ) increase in PBLs, possibly due to an increase in CD8<sup>+</sup> and CD16<sup>+</sup> lymphocytes, which had significantly increased post-treatment ( $P < 0.01$ ). Consequently, the CD4<sup>+</sup>/CD8<sup>+</sup> ratio decreased significantly ( $P < 0.01$ ). These results suggest that aromatherapy massage is a valuable relaxation technique for reducing anxiety and stress, and beneficial to the immune system.

Similarly, Imanishi et al. (6) compared the results obtained 1 month before the aromatherapy massage as a waiting control period with those during aromatherapy massage treatment and obtained 1 month after the completion of aromatherapy sessions in 12 breast cancer patients. The patients received a 30 min aromatherapy massage twice a week for 4 weeks (eight times in total) by using jojoba oil, sweet orange oil (*Citrus aurantium*), lavender oil (*Lavandula angustifolia*) and sandalwood oil (*Santalum album*). The results showed that anxiety was reduced in one 30 min aromatherapy massage according to the *State-Trait Anxiety Inventory* (STAI) test and also in eight sequential aromatherapy massage sessions according to the Hospital Anxiety and Depression Scale (HADS) test. The results of the Profile of Mood States Test showed that aggression-hostility and fatigue were gradually reduced, but there were no significant differences in anger-hostility between scores tested 1 month before massage and immediately before the fifth massage and between scores tested 1 month before massage and immediately before the eighth massage. A significant difference was observed in aggression-hostility between scores tested 1 month before and after the massage ( $P < 0.05$ ). Regarding the immunological parameters, there were no significant differences in the number of leukocytes, and neutrophils, lymphocyte, CD4-positive lymphocytes and CD8-positive lymphocytes which are types of leukocytes, in the waiting control period. Leukocytes and lymphocyte increased significantly after the eighth aromatherapy massage session, as compared with those before the eighth massage. CD4-CXCR3-positive lymphocytes had a tendency to increase after the first and eighth aromatherapy massage, compared to those before the first and the eighth massage. CD4-CCR4-positive lymphocytes also tended to increase by the first aromatherapy session. According to results, it could be suggested that aromatherapy massage ameliorated the immunologic state and that it could be a viable complementary therapy that significantly reduces anxiety in breast cancer patients.

Despite of the physical and psychological benefit of the massage (aromatherapy massage) The MD Anderson Cancer Centre at the University of Texas reported some dangers involved with oncologic massage. Massage performed by an untrained massage therapist could result in cancer cells breaking off from the original tumour, allowing the cancer to spread. Some radiation patients reported elevated sensitivity to touch, resulting in inflammation and lymphedema. Patients who are on a heavy drug regimen may bruise easily, especially if any form of a deep tissue massage such as myotherapy is performed. Also, there are some types of essential oils that should be avoided (contraindicated) in certain cancer patients. For example, some types of cancer have a strong relationship to the hormone estrogen. If these cancers, including breast or ovarian cancer, are the issue, essential oils with a strong estrogen link should be avoided for cancer massage, such as lavender and tea tree oils.

The American Cancer Society recommends decisions in order to incorporate massage in a cancer treatment plan, which is to be formulated with the primary physician and the massage therapist, so that each practitioner and the patient understand the possible risks and benefits of massage, as well as what to expect from a massage session<sup>3</sup>.

## CONCLUSION

Results of different scientific investigations confirmed that the use of aromatherapy in clinical conditions could have positive effect on some psychological, physiological, endocrine and immunological parameters. Although there is no evidence to suggest that aromatherapy massage helps to treat or prevent cancer, some reports suggest that it may help control the side-effects and symptoms of the disease.

Also, there is a great number of clinical researches on aromatherapy in various problem fields but the review of literature points to gaps in the knowledge related to the clinical application of aromatherapy in relation to issues of dosage, methods of administration and therapeutic effects (23). Issues such as small sample sizes and the difficulty in replicating these studies make it difficult to generalize the findings. In order to achieve the best practice, further researches regarding essential oils selections, referral and effective planning of treatment and rigorous methods of evaluation are needed.

## Conflict of interest

We declare no conflicts of interest.

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<sup>3</sup> American Cancer Society, www.cancer.org

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