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File: ■ Lavender (*Lavandula angustifolia*, Lamiaceae)
■ Melatonin
■ Aromatherapy

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RE: Aromatherapy with Lavender Essential Oil Increases Melatonin Levels in Older Adults

Velasco-Rodríguez R, Pérez-Hernández MG, Maturano-Melgoza JA, et al. The effect of aromatherapy with lavender (*Lavandula angustifolia*) on serum melatonin levels. *Complement Ther Med*. December 2019.47:102208. doi: 10.1016/j.ctim.2019.102208.

Melatonin is a hormone secreted by the pineal gland that regulates the body's circadian rhythm. Synthesis and secretion of the hormone is enhanced in the evening when it is dark to promote sleep and inhibited in the morning when it is light to promote wakefulness. Aging impairs the nocturnal synthesis of melatonin and is linked with impaired sleep. Melatonin supplementation has been demonstrated to decrease sleep latency and increase sleep duration but contributes to polypharmacy – the concurrent use of multiple medications – in older adults. Alternatively, lavender (*Lavandula angustifolia*, Lamiaceae) contains bioactive compounds – namely linalyl acetate and linalool – that possess sedative and anxiolytic properties, which may help promote sleep. The purpose of this pre-experimental, quantitative study was to determine the effects of aromatherapy with lavender on serum melatonin levels in community-dwelling older adults.

Eighty-seven adults age 60 years and older were recruited from two senior centers for recreation and socialization from a community in Colima, Mexico. Inclusion criteria included physically and mentally active older adults without allergies, respiratory illness, or conditions that could be adversely affected by aromatherapy mist. Participants were excluded if they did not attend all aromatherapy sessions, voluntarily declined to participate, or experienced adverse reactions during the intervention with aromatherapy.

Essential oil from 100% pure lavender of Bulgarian origin was produced by an essential oil manufacturer (Aura Cacia; Norway, Iowa) through steam distillation. A 0.5 fl. oz. dropper bottle, containing the equivalent of 15 mL essential oil and a concentration of 14.17 grams of lavender, was used. Aromatherapy was inhaled using an electric ultrasonic cool mist diffusor (ZAQ Dew; Northbrook, Illinois). Five drops (236 mg) of lavender essential oil were diluted in 20 mL of distilled water for each aromatherapy session. The participants were in contact with the dispersed essence (2.95 mg) for 30

minutes per session. The aromatherapy sessions were carried out in a room with adequate lighting, no noise or distractors, and a room temperature of 24°C (75°F) and 34% humidity. No fans or air-conditioning were used, and the participations were instructed not to wear perfume or deodorant so the lavender essence would not be affected. The room was permeated with the lavender essence by placing the diffuser in the center of the room 15 minutes before the participants entered. Two study workers served as olfactory sensors. To prevent the environmental aroma from being altered, participants were instructed not to engage in physical activity that could result in sweating before attending the aromatherapy session. Two aromatherapy sessions were carried out weekly for four weeks for a total of eight exposures. Following an eight-hour fast, blood samples were drawn from the participants 15 minutes before the first aromatherapy session and following the eighth session to quantify pre- and post-aromatherapy serum melatonin levels, with both samples drawn at 9 am.

Of the 87 participants recruited, 20 were eliminated for not meeting the inclusion criteria, leaving 67 participants (37 females, 30 males) with a mean age of 69.1 ± 6.4 years to complete the study. A total of 15% of the participants were employed, 50% were married, and 28.1% were widowers or widows. Fifty-nine percent had a basic education, and 6.25% had a university education. Compared with the pre-aromatherapy mean serum melatonin level, the post-aromatherapy level was significantly higher (102.3 ± 33.4 pg/mL vs. 132.5 ± 42.3 pg/mL, $P = 0.000004$). When stratified by sex, the pre-aromatherapy mean serum melatonin level was significantly lower compared with the post-aromatherapy mean serum melatonin level for both women (101.8 ± 33.1 pg/mL vs. 134.2 ± 41.6 pg/mL, $P = 0.00005$) and men (103.9 ± 35.3 pg/mL vs. 127.3 ± 45.4 pg/mL, $P = 0.026$). No significant differences were found when the measurements were compared between the two sexes. No adverse effects were observed during the aromatherapy sessions.

Based on their results, the authors conclude that aromatherapy with lavender essential oil increases serum melatonin levels in older adults. The authors recognize the limitations of their study protocol and call for larger studies in patients with sleep disorders. The authors declare no conflicts of interest.

– *Gavin Van De Walle, MS, RD*

Peer Reviewer's Comment

The authors assume that the lavender oil used contains linalyl acetate and linalool. It indeed does. However, in a scientific paper, one would like to see the analysis of the essential oil used in the study. In this paper, there is no information about its composition. It would have been much better if the authors had used a pure linalyl acetate and linalool mixture in their study to compare with the essential oil.

The American Botanical Council has chosen not to reprint the original article.

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