



**Sleep Benefits of Lavender:** clinical trials demonstrate that lavender can improve sleep.

When in bed, inhale the lavender for a minimum of 5 minutes or place a few drops on your pillow or diffuser to feel the benefits of lavender all night long. Place the eye mask over your eyes to minimize light exposure at night and to bump up your nocturnal melatonin levels. “Nighty night and sleep tight”



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Review article

## Lavender and sleep: A systematic review of the evidence

Kate Louise Fisser, Karen Pilkington\*

*School of Life Sciences, University of Westminster, 115 New Cavendish Street, London W1W 6UW, United Kingdom*

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- ✚ Aromatherapy entails the use of fragrances and aromas to achieve a desired health outcome like reducing anxiety and promoting sleep.
- ✚ Fragrance aromatherapy involves the inhalation of pure essential oils derived from plants like lavender.
- ✚ Over 200 species of lavender (*Lavandula*) are reported to exist and it is the flowering heads that contain the active ingredients consisting of linalyl acetate and linalool (a monoterpene).
- ✚ The fragrance can be released through steam distillation or by rubbing the lavender flower seeds in your hands.
- ✚ Lavender oil acts on the same receptors as alcohol, benzodiazepines and progesterone to produce a calming effect in the body.
- ✚ Lavender drops on one’s pillow, lavender eye masks, lavender drops in a diffuser all have been shown to improve sleep quality especially by increasing deep sleep and reducing wake frequency during the night.
- ✚ In one study, lavender increased vigour upon waking.
- ✚ No adverse effects of lavender were reported.
- ✚ In a multi-center, double-blind, randomized study assessing the efficacy of a lavender oil preparation, Silexan, compared to lorazepam (a commonly used benzodiazepine to reduce anxiety) to reduce generalized anxiety disorder were similar [Woelk and Schlafke, *Phytomedicine* 2010, Feb: 17(2): 94-99].
- ✚ Bump up your natural melatonin levels by inhaling lavender and by wearing an eye mask minimizing light exposure at night (see below). A recent 2019 study by Velasco-Rodriguez et al. demonstrated that daily

inhalation of lavender for 30 minutes over 4 weeks bumped up melatonin levels in a geriatric population. Diffuse through the night to release your natural melatonin levels to enhance your sleep.



## The effect of aromatherapy with lavender (*Lavandula angustifolia*) on serum melatonin levels



R. Velasco-Rodríguez<sup>a</sup>, M.G. Pérez-Hernández<sup>a</sup>, J.A. Maturano-Melgoza<sup>a</sup>, Á.G. Hilerio-López<sup>a</sup>, A. Monroy-Rojas<sup>b</sup>, B. Arana-Gómez<sup>c</sup>, C. Vásquez<sup>d,\*</sup>

<sup>a</sup> Universidad de Colima, Facultad de Enfermería, Colima, Colima, Mexico

<sup>b</sup> Universidad Autónoma Metropolitana (campus Xochimilco), División de Ciencias Biológicas y de la Salud, Mexico City, Mexico

<sup>c</sup> Universidad Autónoma del Estado de México, Facultad de Enfermería y Obstetricia, Toluca, State of Mexico, Mexico

<sup>d</sup> Universidad de Colima, Centro Universitario de Investigaciones Biomédicas, Colima, Colima, Mexico

### Healthy Lifestyle Tips to Minimize Chronodisruption By Light Exposure at Night

(from Paula Witt-Enderby, Ph.D.)

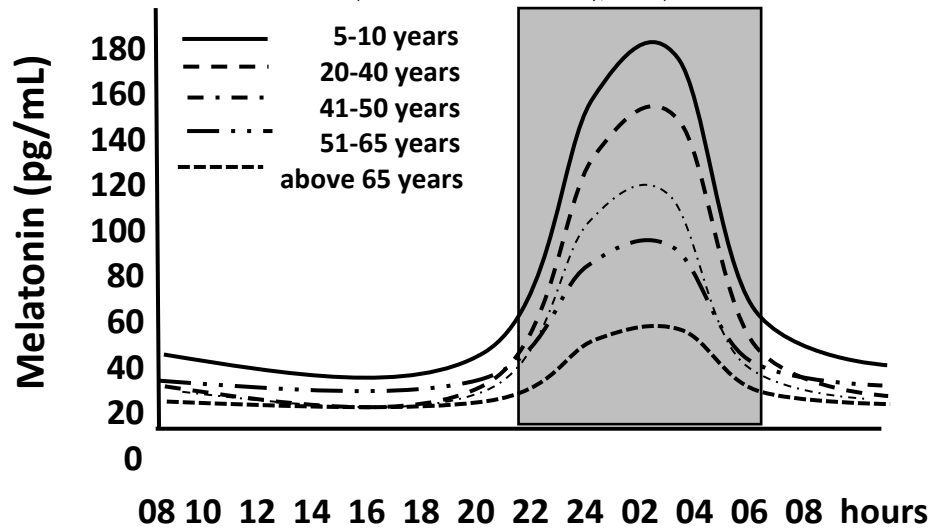


Figure Adapted from J Physiol Pharmacol. 2006 Nov;57 Suppl 5:19-39

#### Main points:

- (1) As shown in the graph above, melatonin is synthesized and secreted during the hours of darkness (between 2200-0600h). Light inhibits melatonin synthesis and release from the pineal gland whereas a darkness stimulates melatonin production and release from the pineal gland. With age, peak nocturnal levels of melatonin decline and in some elderly individuals there is no discernable nocturnal melatonin peak. This may explain why the elderly have difficulty sleeping (wake up too early or have short sleep duration) (Lassila et al., 2014; Maria and Witt-Enderby 2017; Witt-Enderby et al., 2012).
- (2) Besides age, light exposure at night decreases these nocturnal melatonin peaks. Even light that we cannot see is enough to suppress these melatonin rhythms in our bodies. This can come from the moon (especially a full moon), our street lights, skies, light bulbs (we have moved away from incandescent bulbs which mainly emit low level yellow wavelengths to higher intensity lamps that emit mostly high intensity blue/violet wavelengths=459nm). It is estimated that 90% of people use some form of electronic device within one hour of bedtime (e.g., cell phones, tablets, computers, television sets, etc.) (Navara and Nelson, 2006). Even 39 minutes of usage can significantly suppress melatonin levels (Bedrosian et al., 2016). To minimize light-induced melatonin suppression at night:
  - a. Wear a light fitting eye mask (especially from 11am-5am). They are cheap (\$2-\$3).
  - b. Close your shades at night to minimize light exposure from street lights and the skies

- c. Filter blue light on your devices. There are many free downloadable apps on the web.
  - d. Remove nightlights, rock salt lamps or any other light-emitting device in the bedroom
  - e. If you watch TV, set a timer so it turns off before midnight.
- (3) Increase daytime exposure to natural lighting. According to US and Canadian population-based surveys, people spend about 12% of their time outdoors (1-2.4h during the summer months and only 0.4-1.3h during winter months no matter where one lives) (Cole et al., 1995, Hubert et al., 1998, Diffey, 2011).
  - (4) Have regular mealtimes and finish eating 2 hours before bed. Circadian regulation of the microbiome occurs that is driven by the master biological clock (SCN) where microbial proximity to mucosal surface was highest during the dark phase. Disruption of the circadian clock in the brain disrupts the circadian rhythm of the microbiome. Scheduled feeding restored these rhythms to the dark phase (Thaiss et al., 2016). In a rodent model, melatonin prevented obesity through the modulation of gut microbiota. Melatonin improved metabolic parameters in this model and reduced low grade inflammation, in part, by decreasing the bacteria in the gut responsible for inflammation. Melatonin is synthesized in the GI tract and it is thought that through its antioxidant and free radical scavenging properties, melatonin protects the integrity of the mucosal lining.
  - (5) Reduce stress in your life. Humans display rhythmic patterns of cortisol where levels are highest in the early morning (~8am). The SCN (master biological clock) is primarily responsible for driving the diurnal rhythms of cortisol. Cortisol and melatonin levels are inversely related (i.e., when melatonin levels are high, cortisol levels are low and when melatonin levels are low, cortisol levels are high). Shift work, sleep deprivation, workplace lighting (absence of windows) can elevate nighttime and daytime cortisol levels (Bedrosian et al., 2016).

**Lifestyle Goals:** You want to *increase* your light exposure during the hours of light and *minimize* your light exposure during the hours of darkness. This helps to keep our circadian clock in the brain in sync with the light/dark cycle and will maintain appropriate circadian rhythmicity in peripheral organs like the adrenal glands, bone, liver, and microbiota to keep us healthy.

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