



Phototherapy: Is bright light an effective alternative for the treatment of insomnia disorders?

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Human beings spend a third of their lives in sleep. While we sleep, some important functions such as the recovery of homeostasis or the consolidation of learning are carried out. For these reasons, people with insomnia suffer a significant alteration of their daytime functioning. Exposure to bright light, whether from the sun or from artificial lamps, is known as phototherapy or light therapy and it could be an important alternative to conventional treatments used to treat different types of insomnia.

Insomnia is the most frequent sleep disorder, affecting, approximately, a third of the adult world population. Insomnia can appear at different times during the sleep period: there is sleep-onset insomnia, sleep-maintenance insomnia, and early-morning-awakening insomnia. People suffering from insomnia also suffer daytime disturbances, have a greater risk of developing specific psychiatric disorders, are frequently absent from work and their life quality is, generally, worse (American Psychiatric Association, 2014).



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The most common treatment for insomnia is pharmacotherapy, usually in the form of self-medication. However, pharmacotherapy should only be considered in those cases where it is strictly necessary and other options have failed, because

benzodiazepines might become addictive, and sedative antihistamines and antipsychotics carry a large amount of adverse and residual effects (Matheson & Hainer, 2017).

Among the most common non-pharmacological treatments we find cognitive therapy, stimulus-control therapy, relaxation therapy, and even sleep restriction, being cognitive therapy the most effective alternative. The first steps of treating insomnia should focus on identifying and removing persisting habits, beliefs and factors that cause the disorder, the alteration of dysfunctional beliefs and attitudes about sleep as well as establishing measures of sleep hygiene (Morin, et al., 1999). Unfortunately, the high abandon-rate of some of these treatments makes their application as a long-term treatment impractical in many cases.

But there are some publications that talk about a low-cost alternative for which there is no known evidence of side effects so far: phototherapy. Light therapy or phototherapy consists of exposing the eyes to bright light from the sun or from artificial lamps, modifying several parameters such as duration, intensity, wavelength, and the moment of the day in which it is applied, depending on the type of insomnia to be treated.

Sleep onset insomnia and early-morning-awakening insomnia have been associated, respectively, to delays and advances in circadian rhythms. Circadian rhythms determine the intervals of sleep and wakefulness and depend mainly on an internal clock: the suprachiasmatic nucleus, a group of neurons receiving direct information from the retinas and controlling the synthesis and release of melatonin based on the incoming light information. Darkness stimulates melatonin secretion, while light conditions inhibit it, leading to awakening (Lovato & Lack, 2013). With light being such an important factor in sleep regulation, it is not surprising that some types of insomnia can be treated by using exposure to bright light.

Morning light stimulation has proven to be more effective in the treatment of sleep-onset insomnia (Lack & Wright, 2007). When waking up, light is applied for a full hour, and every subsequent morning the waking hour is advanced 15 minutes, while the session is reduced for the same time, until the desired waking up time has been achieved. The treatment is then continued for, at least, 14 extra mornings to ensure the results (Lovato & Lack, 2013). Lack, Wright & Paynter (2007) observed that, when treating sleep-onset insomnia, phototherapy was able to decrease the latency of the onset of sleep and increase its duration, decrease anxiety, fatigue and sleepiness before going to bed, thus providing an overall improvement in daytime functioning. On the other hand, when treating early-morning-awakening insomnia, it has been observed that it is better to apply light stimulation at night (Lack & Wright, 2007). It is enough to apply light therapy four hours before going to bed during two nights to appreciate an improvement in patients (Lovato & Lack, 2013). Furthermore, other variables such as light wavelength have an impact on the results of the treatment. Wright, Lack & Kennaway (2004) applied phototherapy with five different types of wavelengths and a control situation without light: they discovered that those lights with shorter wavelengths (blue and green) were more effective in treating insomnia than lights with longer wavelengths (red, orange, and/or yellow).

In conclusion, the treatment of insomnia should follow, first and foremost, a non-pharmacological approach. Although cognitive therapy is the most effective treatment to date, its limitations in terms of involvement and abandonment must be considered. Phototherapy, on the other hand, has proven to be effective in treating insomnia, although its efficacy must be investigated in greater depth, studying larger samples to substantiate the validity of its therapeutic use and generalizing the results. Still, phototherapy is a promising treatment that should have a greater exposure in the scientific and academic literature in the years to come.

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