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The potential role of sleep symptoms in tobacco withdrawal for the success of cessation therapies

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Dear Editor,

Smoking is among the main causes of preventable deaths worldwide and inflicts high costs on health systems [1]. According to World Health Organization (WHO), cigarettes promote a range of conditions, such as cancer and cardiac diseases, and constitute one of the most important behavioral health risks in the world [1]. Thus, it is vital to seek effective cessation therapies with high adherence.

The quality of sleep needs to be considered in individuals who are struggling to quit smoking. According to Leonel et al. [2], a bidirectional relationship between sleep quality and nicotine addiction must be reflected. This would constitute a vicious cycle, with tobacco use negatively affecting sleep, and unhealthy sleeping habits leading to a worse smoking profile. It is possible that better sleep, which is influenced by physical activity and an overall healthier lifestyle in smokers, could contribute to decreases in cigarette consumption and the associated urge and craving to use it [5].

The connection between tobacco withdrawal and sleep impairment is directly connected with nicotine, which acts by stimulating the nicotine-acetylcholine receptors present in the hypothalamus [3]. The changes caused by nicotine in the hypothalamic receptors influence another system that receives direct input from the hypothalamus, the sleep–wake cycle [3]. The sleep–wake cycle is an essential component for the maintenance of the essential functions of the human body and relates to the regulation of homeostasis, well-being, mood, concentration, and memory [3]. The existence of these processes supports the hypothesis that sleep

is an important aspect in the success of smoking cessation therapies.

Evidence indicates that sleep impairment, a common symptom during nicotine abstinence syndrome, increases the risk for a relapse [4]. On the first days after stopping smoking, there is a marked reduction in sleep quality, manifested by insomnia, slow-wave sleep (SWS) deficits, and longer more frequent awakenings [4]. Although the mechanisms responsible for this are not entirely clear, the withdrawal symptoms reported in the first days of the removal of nicotine may be correlated to the poor sleep quality observed in this period [4]. Individuals who are trying to give up tobacco use often complain of having poor sleep and this might be a factor in the low success rate of conventional treatments [4].

A cost-effective solution to the concern of sleep complaints resulting in low adherence to therapies is to introduce exercise into the routine. Exercise was potentially helpful as an adjunct therapy to help attenuate withdrawal symptom severity and the sleep impairment [5]. It is possible that exercise has a moderating effect by producing faster sleep onset, increasing SWS, and reducing anxiety, contributing, therefore, to a better success rate in the pursuit of smoking cessation.

Knowledge of the relationship between sleep symptoms during nicotine withdrawal is a great target for promoting better results in tobacco discontinuation attempts, and these changes in sleep deserve marked attention in clinical practice. Interventions that take into account sleep complaints and use exercise as an adjuvant therapy can be more successful in helping the users to give up smoking. Future studies should further explore deeper this bidirectional relationship between tobacco dependence and sleep complaints to expand understanding of the role of sleep in the outcome of cessation therapies and help to reduce relapses.

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Declarations

Conflict of interest The authors declare no competing interests.

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