

# Sleep deprivation and exercise

**Keywords:** sleep deprivation, insomnia, AKT, CREB, BDNF

## Editorial

There are many studies have shown benefits of exercise on various aspects caused by sleep deprivation and insomnia. The most positive effects are related to cognitive deficits followed by sleep disorders. The positive effects of exercise on sleep deprivation are well shown by many findings. Regarding the lack of publications about this issue in the journal, it is better to consider this issue in the journal volumes and invite the authors to release their current findings about exercise and sleep deprivation even through a special issue in this journal. According to the studies, sleep deprivation causes many disorders such as increasing oxidative stress enzymes<sup>1</sup> learning and spatial memory,<sup>2,3</sup> cognitive function and synaptic plasticity,<sup>4</sup> learning, stress and anxiety.<sup>5</sup> Furthermore, the positive influence of exercise in different type and time have been shown frequently such as increasing in hippocampus plasticity via AKT, CREB and BDNF signaling,<sup>6</sup> spatial learning and memory<sup>3,7</sup> hippocampus and striated brain-derived neurotrophic factor levels.<sup>8</sup>

Sleep deprivation can cause negative physical, psychological and cognitive effects, and moderate and regular exercise can be applied to deal with these disorders and can modify cognitive impairments induced by sleep deprivation and stress and improve learning and memory.

## Acknowledgements

None.

## Conflict of interest

The authors declared that there are no conflicts of interest.

## References

1. Alzoubi KH, Khabour OF, Salah HA, et al. The combined effect of sleep deprivation and Western diet on spatial learning and memory: role of BDNF and oxidative stress. *J Mol Neurosci*. 2013;50(1):124–133.

Volume 1 Issue 3 - 2017

**Rouholah Fatemi**

Department of Neurophysiology, Ahvaz Jundishapur University of Medical Sciences, Iran

**Correspondence:** Rouholah Fatemi, Department of Neurophysiology, Faculty of Medicine, Physiology Research Center (PRC), Ahvaz Jundishapur University of Medical Sciences, Ahvaz, IR Iran, Tel +98-61-33738264, Fax +98-6133738248/+98-6133361544, Email r.fatemi61@gmail.com

**Received:** October 30, 2017 | **Published:** November 08, 2017

2. Empson JA, Clarke PR. Rapid eye movements and remembering. *Nature*. 1970;227(5255):287–288.
3. Darkhah P, Zarghami M, Shetab Bushehri N, et al. The effect of exercise on learning and spatial memory following stress-induced sleep deprivation (Sleep REM) in rats. *Jentashapir J Health Res*. 2016;7(2):e32005.
4. Alhaider IA, Aleisa AM, Tran TT, et al. Chronic caffeine treatment prevents sleep deprivation-induced impairment of cognitive function and synaptic plasticity. *Sleep*. 2010;33(4):437–444.
5. Vollert C, Zagaar M, Hovatta I, et al. Exercise prevents sleep deprivation-associated anxiety-like behavior in rats: Potential role of oxidative stress mechanisms. *Behav Brain Res*. 2011;224(2):233–240.
6. Aguiar AS Jr, Castro AA, Moreira EL, et al. Short bouts of mild-intensity physical exercise improve spatial learning and memory in aging rats: Involvement of hippocampal plasticity via AKT, CREB and BDNF signaling. *Mech Ageing Dev*. 2011;132(11-12):560–567.
7. Aguiar AS Jr, Boemer G, Rial D, et al. High-intensity physical exercise disrupts implicit memory in mice: involvement of the striatal glutathione antioxidant system and intracellular signaling. *Neuroscience*. 2010;171(4):1216–1227.
8. Albeck DS, Sano K, Prewitt GE, et al. Mild forced treadmill exercise enhances spatial learning in the aged rat. *Behav Brain Res*. 2006;168(2):345–348.