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## Effect of 40 min nap opportunity on heart rate variability in high-level professional basketball players

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### INTRODUCTION:

Napping has been proposed as a safe and non-invasive intervention to supplement night-time sleep and improve physical and cognitive performances in athletes (for systematic-review see Souabni et al., 2021). Sleep and autonomic nervous system (ANS) influence each other in a bidirectional fashion. Importantly, it has been proposed that sleep has a beneficial regulatory influence over cardiovascular activity, which is mostly controlled by autonomic regulation through the activity of sympathetic and parasympathetic pathways of the ANS (Trinder et al., 2013). A well-established method to non-invasively assess cardiac autonomic activity is heart rate variability (HRV) analysis (Tobaldini et al., 2013). The aim of this study was to investigate the effect of 40 nap opportunity on HRV.

### METHODS:

Each participant of twelve high-level professional basketball players accomplished randomly two conditions: 40-min nap opportunity (NAP) and control condition (CON). Nocturnal sleep and naps were monitored by actigraphic recording and sleep diaries. The following parameters were derived and analyzed: total sleep time (TST), time in bed (TIB), sleep efficiency (SE), sleep onset latency (SOL) and wake after sleep onset (WASO). HRV was analyzed in 5-min segments during quiet wake before and after each condition with controlled breathing. Were analysed the two major components of the frequency domain, i.e., high frequency (HF, 0.15–0.4 Hz) and low frequency (LF, 0.04–0.15 Hz) bands, and for the time domain, the standard deviation of NN interval (SDNN), an index of global variability, and the root mean square of successive differences (RMSSD), a parasympathetic index. Moreover, Wellness Hooper index and Epworth Sleepiness Scale (ESS) were measured before and after both conditions.

### RESULTS:

Statistical analysis showed no significant difference during the night before experimental days in objective (i.e., TIB, TST, SE and WASO) and subjective (i.e., VAS) sleep parameters between CON and NAP conditions.

Regarding HRV analysis, although no significant differences were reported for LF normalized units (LFnu), HF normalized units (HFnu), SDNN and RMSSD in CON condition, we noticed a significant increase in SDNN and LFnu, and HFnu during post-nap compared to pre-nap wakefulness.

### CONCLUSION:

These results may indicate relative sympathetic dominance after nap. Moreover, ESS, Hooper's stress and fatigue scores were significantly lower after nap compared to values before nap, however no significant difference was reported in CON condition.

In conclusion, napping reduces sleepiness, stress and fatigue, and might provide an advantage by preparing the body for a much- required sympathetic comeback following peaceful rest.

### References:

Souabni M, Hammouda O, Romdhani M, Trabelsi K, Ammar A, Driss T. Benefits of Daytime Napping Opportunity on Physical and Cognitive Performances in Physically Active Participants: A Systematic Review. *Sport. Med.* 2021; 51(10):2115-2146.

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