Daytime napping during congested training schedule improved perceptual and physical performances, sleep quality and cardiac autonomic function in High-Level Adolescent Basketball Players

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Résumé

Introduction : Research has shown that adolescent athletes experience insufficient sleep (Souabni et al., 2024), impacting their health (Mason et al., 2023) and performance (Suppiah et al., 2016). Napping has emerged as a promising sleep management strategy to counteract these consequences (Souabni et al., 2021). While napping's acute benefits on performance have been demonstrated, its chronic impact remains unclear. This study examined the effects of a five-day micro-cycle of 60-minute daytime naps on physical and cognitive performance, as well as perceptual and physiological responses in adolescent athletes.
Methods: Twelve male adolescent basketball players (15.75 $\pm$ 0.62 years) participated in a randomized, counterbalanced crossover study with two conditions: five consecutive napping days (NAP) and five consecutive control (no napping) days (CON). Sleep was monitored via actigraphy, while perceptual (Hooper questionnaire) and physiological (Heart Rate Variability, HRV) responses were assessed each day pre- and post-nap/rest across five days. Basketball-specific performances including offensive (OA) and defensive agility (DA), upper body power (UBP), and repeated jumps (RJ) were evaluated on days 1 and 5. Rating of perceived exertion (RPE) was recorded after RJ.

Results: NAP increased total sleep time (TST) over 24h (p=0.003), with longer and better-quality naps toward the end of the micro-cycle. Napping enhanced overall HRV ($p = 0.033$), reduced subjective fatigue, muscle soreness and RPE ($0.002 \leq p \leq 0.035$). While a single nap had no effect on basketball-specific physical performances, five consecutive naps significantly

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improved offensive and defensive agility, and jump performance ($0.001 < p \leq 0.025$).

Discussion: the increase in TST over 24h in NAP condition ensured the athletes adherence to sleep recommendations (i.e., 8 – 10h) (Hirshkowitz et al., 2015). Moreover, the improved overall HRV, indicating enhanced autonomic flexibility and recovery (Alqatari et al., 2020), along with reductions in perceptual markers of fatigue and muscle soreness across the micro-cycle, highlights the cumulative benefits of repeated napping for recovery and athletes' readiness for a subsequent effort. The positive effect of repeated napping on physical performance may also be attributed to enhanced metabolic recovery, as longer nap durations are more likely to include a significant proportion of slow-wave sleep (Sirohi et al., 2022).

Conclusions: Repeated napping improved perceptual and physiological responses, and sport-specific abilities, highlighting its relevance as a non-invasive strategy to support recovery and well-being in adolescent athletes, particularly during high-load training camps.

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