Title: Daytime napping behaviour and hyperarousal in athletes

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Daytime napping is common among high-performance athletes, and is widely assumed to result from sports-related sleep debt. However, recent evidence that some athletes are able to nap ‘on demand’ suggests that the management of daytime arousal (or hyperarousal) may complement, or even supersede homeostatic pressure as the key factor mediating athlete naps. The present study, therefore, was designed to explore the nap behaviour of high-performance athletes in relation to sleep quality, sleep duration, and pre-sleep arousal.

Convenience sampling approaches identified UK athletes competing at (at least) a regional level. Participants completed an online questionnaire comprising assessments of: sleep history sufficient to categorise those meeting DSM-5 criteria for insomnia disorder; daytime napping typology (frequency and duration); sleep quality (PSQI); sleep reactivity (FIRST); and the Pre-Sleep Arousal Scale (PSAS).

Overall, 109 athletes (60 female) completed the questionnaire. The mean PSQI score was 6.2 (SD =2.6), with 23.9% meeting symptom severity and duration criteria for DSM-5 insomnia disorder. Pre-sleep cognitive arousal was significantly higher among athletes with insomnia disorder compared to athletes without insomnia (U<0.0001). Daytime napping was reported by 51% of athletes. In t-tests comparing nappers and non-nappers, napping was unrelated to PSQI scores (nappers = 6.3 v non-nappers = 6.1; p = 0.77) and subjective total sleep time (nappers = 450.min v non-nappers = 454.8 min; p = 0.75). Chi-square analyses showed that reported napping (yes/no) was significantly related to levels of cognitive arousal, with higher arousal associated with non-napping (chi-square =4.22, p =0.04). Finally, in a multiple regression model, higher PSAS scores (ß = 1.12; p=03), FIRST scores (ß = 5.79; p=01), and lower TST (ß =0.98; p=01) predicted higher PSQI scores.

Napping among high performance athletes is not adequately explained by homeostatic sleep pressure arising from sleep debt, since nappers and non-nappers show a similar quantity and quality of sleep. Rather, the construct of cognitive arousal, and the related construct of sleep reactivity, appear to play an important role in both the likelihood of napping, and the achievement of optimal sleep quality. These results suggest that the mediating role of hyperarousal in athlete sleep merits further investigation.