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[abstract only]**

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Sleep efficiency in a cohort of elite level soccer players

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We recorded sleep parameters via wrist worn accelerometers (GENEActiv) for 7 days in 14 elite level male soccer players in the middle of the 2016/17 football season. For comparison, we also collected 7-days of sleep data from 14 similar aged male, non-obese, physically active undergraduate University students, with no reported sleep problems. We sought to combine sleep duration and efficiency to rate sleep as either: 'good' 'average' or 'poor'. Individuals were classified as having good sleep quality based on an efficiency $\geq 85\%$, and duration of ≥ 420 min. Poor sleep quality was based on an efficiency $\leq 75\%$ or duration ≤ 360 min. The remaining individuals were therefore classified as having average sleep quality. We also measured dietary intake levels via 7-day dietary inventory for both groups during the week of sleep analysis.

The footballers and students returned 67 and 70 nights of sleep data respectively. The mean average sleep efficiency for the footballers was very similar to that of the students (79% v 79%; $P = 0.67$). In this group of academy level football players only 21% of the sample recorded sleep data would qualify as 'good' with 42% as 'average' and 37% as poor. This compares to the students' sleep which was 20%, 37% and 43%, for good, average and poor respectively. The data were assessed as not meeting parametric requirements and subsequently between-group comparisons were carried out using Mann-Whitney U tests for: total energy, carbohydrate, fat, protein, caffeine, tryptophan and alcohol intakes. These were all not significantly different, with the exception of protein which was higher in the football players ($P = 0.009$).

In conclusion, the two groups appear similar in terms of sleep quality. Football players, who are required to recover efficiently from exercise and have high levels of concentration, have high levels of 'poor' and 'average' sleep quality. Interventions, such as sleep hygiene protocols, may improve sleep quality in football players (and students). Given that the shift needed for most of the cohort to move into the 'good' category is small in percentage terms, a relatively mild intervention may help football players make that shift.