Fullagar. Int J Sports Exerc Med 2015, 1:1
ISSN: 2469-5718

International Journal of
Sports and Exercise Medicine

Perspective: Open Access

Late-Night Matches for Professional Soccer Players: Should we be Concerned about Sleep and Recovery?

Hugh H.K. Fullagar*

Institute of Sports and Preventive Medicine, Saarland University, Germany

***Corresponding author:** *Hugh Fullagar, Institute of Sports and Preventive Medicine, Saarland University, GEB. B82, 66123 Saarbrucken, Germany, Tel: 0681-302-70400, Fax: 0681-302-4296, E-mail: hugh.fullagar@uni-saarland.de*

Keywords

Football, Regeneration, Circadian rhythms, Exercise, Athlete

Elite soccer players compete within the uppermost echelon of the most popular and participated sport in the world. Both male and female stars of the game, from Cristiano Ronaldo to Marta Vieira, entertain hundreds of millions of people worldwide. Indeed, the financial growth of the game in recent decades has enabled global television audiences to witness the game they love. Due to the financial influx they provide, television networks can now also influence the timing of matches. An example of this is the 'late' kick off time of 20:45 (corresponding to primetime viewing) in most European countries for the UEFA Champions League or for many matches of national teams. Such timing of matches has raised questions from numerous media, scientific and applied platforms (including those who contribute and read the *International Journal of Sport and Exercise Medicine*) regarding player's sleep and recovery patterns [1], perhaps not least of all from some of the world's most elite coaches:

"If we stay behind in a hotel afterwards, the players won't sleep until three or four o'clock and some won't sleep until five or six because just after a game it can be difficult to sleep. But if you come home straight away, even if you don't get to bed until 4am that night, you can leave them in bed until midday, so you don't lose sleep, and you don't lose the next day. I always found it better to recover this way." *Arsenal F.C. coach Arsene Wenger on playing night matches away from home; Arsenal.com*©

Indeed, elite players such as those at Wenger's disposal endure numerous physiological, psychological and neuromuscular stressors during training and competition [2]. Consequently, there is a vital requirement for players to balance these stressors with adequate recovery to maximise performance and ensure effective adaptation, whilst also minimising the risk of injury [3]. A crucial part of this balance is the management of a players' normal sleep-wake cycle [4]. However, forced disruptions to a players' natural environment can force a de-synchronisation between their endogenous circadian rhythms and this sleep-wake cycle, resulting in a circadian shift [5]. Following these periods of altered functioning there is potential for sleep loss to occur and recovery to be compromised [4,6]. As mentioned, a situation where this can happen during a season is when professional teams play at night [7]. However, the evidence of professional players' sleep behaviour following these matches is not widely published or available to the public. Indeed, whilst sleep has been long been presented in numerous public and scientific forums as critical to athletic performance outcomes [8], there is extremely limited information available with regards to sleep in soccer. Thus, to help to alleviate these issues, let us briefly go through some preliminary data we have collected in both top-level European clubs and a national team during their 2014 campaign. Further to this, I will present some recommendations for future research including how researchers and soccer practitioners can combine theory and practice to improve both future scientific and performance outcomes.

Figure 1 depicts the average sleep duration for a top-level European soccer player over twenty one days during the regular season for his club (for training days, match days (kick off 15:30-18:00) and match nights (kick off after 18:00). Measures were ascertained twice per day, whereby the player was asked to complete a short sleep and sporting activity questionnaire (SosciSurvey©) in the morning after awakening, and at night prior to sleeping. A seen in Figure 1, this player slept for significantly less time following night matches (5.2 h) compared to training days (8.8 h) and day matches (8.3 h). Thus, clearly for this individual player sleeping following a

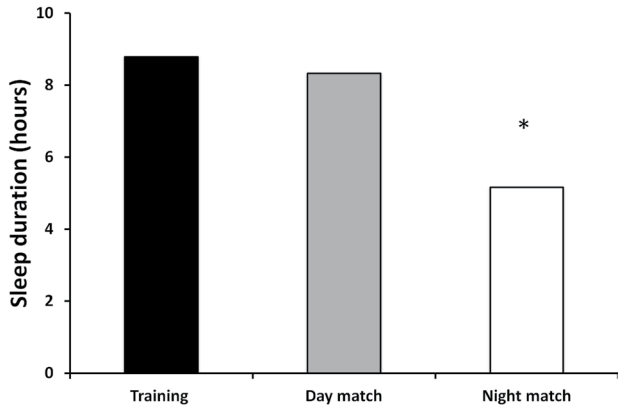

Figure 1: Mean sleep duration (hours per night) for a top-level European soccer player over a 21 day period.

* = significantly different today matches and training days ($p<0.05$).

ClinMed International Library

Citation: Fullagar HHK (2015) Late-Night Matches for Professional Soccer Players: Should we be Concerned about Sleep and Recovery?. Int J Sports Exerc Med 1:002e

Received: March 26, 2015: **Accepted:** March 28, 2015: **Published:** March 30, 2015

night match is difficult. This is similar to previous findings, albeit not in soccer players, with others showing that judo competitors performing maximal aerobic exercise in the evening experience greater elevated sleep-onset latency and awakenings [7]. Reasons for this sleep reduction in our case study obviously point towards the pure extension of this player's normal bedtime. Indeed, given the relationship between sleep loss and both injury [9] and reduced recovery [6], this may well have practical repercussions for training the next day. However, it should be acknowledged that the nature of these night-match situations are fairly acute, thus at this stage it would seem advisable to carefully monitor this player through next day training (if applicable). In addition, the player could possibly engage in napping activity the following day to alleviate the detrimental effects of sleep loss [10]. Whilst soccer clubs usually possess plenty of 'in-house sleep data', at present there is insufficient literature to state whether this loss of sleep will affect recovery within an elite soccer environment.

Although late-night matches appear to disrupt sleep in certain players, such as the one shown above, there are other factors which could also disrupt sleep outside of the pure timing of match activity. For instance, the act of playing itself could retard sleep duration and impair quality, as has been previously hypothesised based on increased arousal at onset of sleep [11]. In contrast, sleep may be further attenuated from other sources (e.g. socialising, psychological reasons). For example, players may sleep differently following a match depending on the psychological load imposed. Theoretically, this would suggest a competitive match inducing a higher psychological load compared to a friendly. To explore such theories, data was collected following both a friendly (kick-off 20:00) and a competitive match (kick-off 18:00) for a national team with the results depicted in Figure 2. Two interesting findings arose from these results: i) Sleep volume was significantly reduced from baseline values following both a 18:00 and 20:00 match, and ii) sleep was similar following both a friendly and competitive match at different kick off times. Unfortunately, given both matches kicked off at different times, it is difficult to extrapolate the effect of the type of match psychological load on sleep here. Equally, the type of match may have altered the 'pure' effects of match time on sleep. As such, further case studies or 'in house' club research on matches of differing levels of competition commencing at similar times (e.g. 20:00) are required to delineate whether it is the effect of the type of match or the timing of the match which has a greater effect on the reduction in sleep. Admittedly, controlling for numerous extraneous variables which may also affect results (e.g. match intensity/activity) is exceedingly difficult in a field based environment.

Taken collectively, it appears professional soccer players experience significant sleep loss following night matches. However, the mechanisms behind the reduction in sleep volume remain unknown. Furthermore, knowledge of the effect of sleep loss on recovery in these situations is limited. Given few teams will train the day following a late-night match, there is an argument that this sleep loss will have little to no effect on the players since they can 'catch up' on sleep the next day. However, teams also lightly train the day after a match and instead have the second post-match day off, thus if players do train practitioners should be aware of the possibility for decreased motivation and at worst, an increase in injury risk [9]. Nonetheless, such instances are very dependent on each situation and the individual in question. Many elite performance managers conduct high intensity pre-season training sessions following periods of sleep loss (from either travel or team bonding exercises) to build character and team harmony. Anecdotally these practitioners report no major injuries or lasting concerns. Given the requirement for sleep is extremely individual, researchers should thus understand that the practitioner's knowledge of their athletes will (in most cases) be superior to their own.

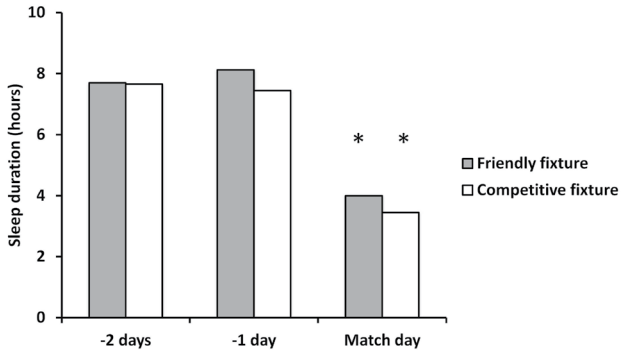

Figure 2: Mean sleep duration (hours per night) of a national team prior to and following a friendly and competitive match.

* = significantly different -2 days and -1 days ($p<0.05$).

From a scientific perspective, researchers should aim to consider as many extraneous factors as possible (balancing internal and external validity) when delineating mechanisms responsible for sleep and recovery in soccer. From a practical perspective, that is to improve performance and reduce injury risk, researchers and practitioners need to decide together in which way it is possible to improve such factors within that specific environment. For instance, the team in question may have to travel extensively every second week to play. Thus, any potential research needs to consider and incorporate these factors. The conduction of scientific studies can extend the knowledge and support team development. Indeed, combining the link between theory and practice is a crucial facet of sport medicine and science. This interaction rings true to all those associated with the *International Journal of Sport and Exercise Medicine*. Collectively, we encourage both scientists and practitioners to work together to improve team performance and our understanding of the numerous interactions within soccer.

Acknowledgements

Hugh Fullagar is supported by a 'Science and Health in Soccer' scholarship funded by the DAAD (German Academic Exchange Centre). The author is deeply thankful to all the players and coaches who participated/assisted in experiments.

Ethical Statement

No funding was provided which contributed to the development of this manuscript. The authors declare that there are no conflicts of interest.

References

1. Fullagar HH, Duffield R, Skorski S, Coutts AJ, Julian R, et al. (2015) Sleep and Recovery in Team Sport: Current Sleep-related Issues Facing Professional Team-sport Athletes. Int J Sports Physiol Perform.
2. Bangsbo J, Mohr M, Krustrup P (2006) Physical and metabolic demands of training and match-play in the elite football player. J Sports Sci 24: 665-674.
3. Kellmann M (2010) Preventing overtraining in athletes in high-intensity sports and stress/recovery monitoring. Scand J Med Sci Sports 20: 95-102.
4. Halson SL (2008) Nutrition, sleep and recovery. Eur J Sport Sci 8: 119-126.
5. Reilly T, Edwards B (2007) Altered sleep-wake cycles and physical performance in athletes. Physiol Behav 90: 274-284.
6. Skein M, Duffield R, Minett G, Snape A, Murphy A (2013) The effect of overnight sleep deprivation after competitive rugby league matches on postmatch physiological and perceptual recovery. Int J Sport Physiol Perform 8: 556-564.
7. Souissi N, Chtourou H, Aloui A, Hammouda O, Dogui M, et al. (2013) Effects of time-of-day and partial sleep deprivation on short-term maximal performances of judo competitors. J Strength Cond Res 27: 2473-2480.
8. Fullagar HH, Skorski S, Duffield R, Hammes D, Coutts AJ, et al. (2015) Sleep and athletic performance: the effects of sleep loss on exercise performance, and physiological and cognitive responses to exercise. Sports Med 45: 161-186.
9. Luke A, Lazaro RM, Bergeron MF, Keyser L, Benjamin H, et al. (2011) Sports-related injuries in youth athletes: is overscheduling a risk factor? Clin J Sport Med 21: 307-314.
10. Faraut B, Nakib S, Drogou C, Elbaz M, Sauvet F, et al. Napping Reverses the Salivary Interleukin-6 and Urinary Norepinephrine Changes Induced by Sleep Restriction. J Clin Endocrinol Metab 100: 416-426.
11. Porter JM, Horne JA (1981) Exercise and sleep behaviour. A questionnaire approach. Ergonomics 24: 511-521.