

**Introduction** Stores' questionnaires survey in 1998 found that UK medical students received a median of 20 minutes education about sleep. We asked whether this situation has improved.

**Methods** A cross sectional survey of 34 medical degree courses in the UK adapted from Stores '1998 questionnaire including time spent on sleep teaching medicine, sub-topics covered, and forms of assessment.

**Results** 25 (74%) UK medical schools responded to our survey. The time spent devoted to sleep medicine during undergraduate training was median 1.5 hours, mode <1 hour, and mean 3.2 hours (standard deviation = 2.6, figure 1). Only two schools had a sleep syllabus or dedicated compulsory module (8%, figure 2). When asked whether sufficient time is allotted to sleep and its disorders, 50% said yes, 38% said no and 13% were unsure. Free text comments made by our respondents had recurring themes: sleep medicine is typically subsumed into teaching by other specialities, with the result that course directors are uncertain about the details of provision; obstructive sleep apnoea is often identified as the key or only relevant sleep disorder, knowledge of sleep disorders is regarded as optional, and there is inertia about the prospect of change. However, a substantial minority of respondents are enthusiastic about making improvements to the sleep education they currently provide.

**Discussion** Sleep medicine remains a neglected topic despite agreement on the importance of sleep in general health. Obstacles to change are similar to those noted by Stores 20 over 20 years ago, including the views that 'sleep is not a core topic' or the 'curriculum is already too crowded'. Given that doctors are often the first point of contact for the public, we recommend that medical schools should establish and implement a sleep medicine curriculum. We suggest a simple syllabus, available on request.

## REFERENCES

- Greenstone M, Hack M. Obstructive sleep apnoea. *BMJ Br. Med. J* 2014;**348**.
- Ferrie JE, Kumari M, Salo P, Singh-Manoux A, Kivimäki M. Sleep epidemiology-A rapidly growing field. *Int. J. Epidemiol* 2011;**40**:1431–1437.
- Bjorvatn B, Grønli J, Pallesen S. Prevalence of different parasomnias in the general population. *Sleep Med* 2010;**11**:1031–1034.
- Hafner M, Stepanek M, Taylor J, Troxel WM, van Stolk C. Why sleep matters—the economic costs of insufficient sleep: a cross-country comparative analysis. *Rand health quarterly* 2017;**6**.
- NICE. Continuous positive airway pressure for the treatment of obstructive sleep apnoea/hypopnoea syndrome. *Technology Appraisal Guidance* 2008.
- Zeman A, Zaiwalla Z. Prescribing sodium oxybate for narcolepsy. *BMJ* 2016;**353**: i2367.
- National Institute for Health and Care Excellence. Insomnia. *Clinical Knowledge Summaries* 2015. Available at: <https://cks.nice.org.uk/insomnia>. (Accessed: 3rd January 2018)
- Stores G, Crawford C. Medical student education in sleep and its disorders. *J R Coll Physicians* 1998;**32**:149–153.
- Rosen RC, Rosekind M, Rosevear C, Cole WE, Dement WC. Physician education in sleep and sleep disorders: A national survey of U.S. medical schools. *Sleep* 1993;**16**:249–254.
- Mindell J. A. et al. Sleep education in medical school curriculum: A glimpse across countries. *Sleep Med* 2011;**12**:928–931.
- Dyas JV. et al. Patients' and clinicians' experiences of consultations in primary care for sleep problems and insomnia: A focus group study. *Br. J. Gen. Pract* 2010;**60**:180–200.
- Nowell LS, Norris JM, White DE, Moules NJ. Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *Int. J. Qual. Methods* 2017;**16**:1–13.
- Youngren WA, Miller KE, Davis JL. An Assessment of Medical Practitioners' Knowledge of, Experience with, and Treatment Attitudes Towards Sleep Disorders and Nightmares. *J. Clin. Psychol. Med. Settings* 2019;**26**:166–172.
- Salas RME, et al. Incorporating sleep medicine content into medical school through neuroscience core curricula. *Neurology* 2018;**91**:597–610.
- Smith AG. A sleep medicine medical school curriculum. *Neurology* 2018;**91**:587–588.

P068

## SLEEP QUALITY IN ATHLETES AND EXERCISERS

Rui Pereira\*, Iuliana Hartescu, Robin Jackson, Kevin Morgan. *Clinical Sleep Research Unit, School of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, UK*

10.1136/bmjresp-2019-bssconf.68

**Introduction** Insomnia symptoms are highly prevalent in athlete populations, with 64%–70% of athletes describing non-restorative sleep, frequent awakenings at night, daytime fatigue and sleepiness.<sup>3 4 8 9 11 12 14</sup> Factors identified to contribute to poor sleep in athletes are intense schedule of training, competition and travelling, early morning training and night-time competition.<sup>5 6 9 11 15</sup> The type of sport practiced is also a significant factor, with aesthetic sports and individual sports causing more sleep problems than team ball sports and team sports, respectively.<sup>13 16</sup> The Cognitive Model of Insomnia explains that a transition from wake to sleep is impaired by cognitive over-activity and intrusive thoughts.<sup>7</sup> The concept of hyperarousal has become a core component of contemporary explanatory models of insomnia.<sup>1 2 7 10</sup> Our study aims to 1) explore the relationship between arousal, sleep vulnerability and sporting performance, and 2) to inform of what type of sports may select for higher levels of arousal and/or sleep vulnerability.

**Methods** The study is a controlled online survey designed to compare elite athletes and a non-competitive/lower-level competitive high exercising control group in eight different sections. The survey comprises validated questionnaires (IPAQ; PSQI; FIRST; PSAS; ESS; VAFS; 5-MEQ; TIPI; GAD-7) and additional questions designed to address topics such as napping, fatigue, training schedule and competition schedule.

**Results** Preliminary results (table 1) from the pilot study (n=6) show the average sleep time in both groups is at recommended guidelines. Competitive elite athletes report a higher level of arousal in the PSAS cognitive scale (21 vs 17.75), higher fatigue (8 vs 6.5) and a discrepancy in obtained and desired sleep time when compared to competitive non-elite athletes.

**Discussion** Elite competitive athletes show a significant cognitive hyperarousal profile, which could have implications for both performance and potential sleep interventions. There are

**Abstract P068 Table 1** Results from pilot study of abstract 'sleep quality in athletes and exercisers'

	Competitive Elite Athletes	Competitive Non-Elite Athletes
<b>Participants (% (n))</b>	33% (2)	66% (4)
<b>Age (years)</b>	25	26.5
<b>Gender (female)</b>	50%	50%
<b>Type of sport (Team)</b>	100%	25%
<b>PSAS* (somatic scale)</b>	8	8.5
<b>PSAS (cognitive scale)</b>	21	17.75
<b>Actual sleep time</b>	7h30min	7hrs
<b>Desired sleep time</b>	7h45min	7h
<b>Napping (Yes) (%)</b>	50%	0%
<b>Average fatigue level**</b>	8	6.5

\*PSAS – Pre-Arousal Sleep Scale

\*\* As indicated by the Visual Analogue Fatigue Scale (VAFS)

limitations in interpretation of findings due to the small number of participants in the pilot survey.

## REFERENCES

1. Bonnet MH, Arand DL. Hyperarousal and insomnia: State of the science. *Sleep Medicine Reviews* 2010;**14**(1):9–15. <https://doi.org/10.1016/j.smrv.2009.05.002>
2. Drummond SPA, Smith MT, Orff HJ, Chengazi V, Perlis M L. Functional imaging of the sleeping brain: Review of findings and implications for the study of insomnia. *Sleep Medicine Reviews* 2004;**8**(3):227–242. <https://doi.org/10.1016/j.smrv.2003.10.005>
3. Erlacher D, Ehrlenspiel F, Adegbesan OA, El-Din HG. Sleep habits in German athletes before important competitions or games. *Journal of Sports Sciences* 2011;**29**(8):859–866. <https://doi.org/10.1080/02640414.2011.565782>
4. Fortier-Brochu É, Beaulieu-Bonneau S, Ivers H, Morin CM. Insomnia and daytime cognitive performance: A meta-analysis. *Sleep Medicine Reviews* 2012;**16**(1):83–94. <https://doi.org/10.1016/j.smrv.2011.03.008>
5. Fullagar HHK, Skorski S, Duffield R, Julian R, Bartlett J, Meyer T. Impaired sleep and recovery after night matches in elite football players. *Journal of Sports Sciences* 2016;**34**(14):1333–1339. <https://doi.org/10.1080/02640414.2015.1135249>
6. Gupta L, Morgan K, Gilchrist S. Does Elite Sport Degrade Sleep Quality? A Systematic Review. *Sports Medicine* 2017;**47**(7):1317–1333. <https://doi.org/10.1007/s40279-016-0650-6>
7. Harvey A. A cognitive model of insomnia. *Behaviour Research and Therapy* 2002;**40**:869–893.
8. Juliff LE, Halson SL, Peiffer JJ. Understanding sleep disturbance in athletes prior to important competitions. *Journal of Science and Medicine in Sport* 2015;**18**(1):13–18. <https://doi.org/10.1016/j.jsams.2014.02.007>
9. Juliff LE, Peiffer JJ, Halson SL. Night Games and Sleep: Physiological, Neuroendocrine, and Psychometric Mechanisms. *International Journal of Sports Physiology and Performance* 2018; **13**(7):867–873. <https://doi.org/10.1123/ijspp.2016-0809>
10. Kalmbach DA, Cuamatzi-Castelan SA, Tonnu Cv, Tran KM, Anderson JR, Drake CL. Hyperarousal and sleep reactivity in insomnia: current insights. *Nature and Science of Sleep* . 2018;**10**:193–201.
11. Lastella M, Lovell GP, Sargent C. Athletes' precompetitive sleep behaviour and its relationship with subsequent precompetitive mood and performance. *European Journal of Sport Science* 2014; **14**(SUPPL.1):123–130. <https://doi.org/10.1080/17461391.2012.660505>
12. Lastella M, Roach GD, Halson SL, Sargent C. Sleep/wake behaviours of elite athletes from individual and team sports. *European Journal of Sport Science* 2015;**15**(2):94–100. <https://doi.org/10.1080/17461391.2014.932016>
13. McCloughan LJ, Hanrahan SJ, Anderson R, Halson SR. Psychological recovery: Progressive muscle relaxation (PMR), anxiety, and sleep in dancers. *Performance Enhancement and Health* 2016;**4**(1–2):12–17. <https://doi.org/10.1016/j.peh.2015.11.002>
14. Riemann D, Spiegelhalder K, Feige B, Voderholzer U, Berger M, Perlis M, Nissen C. The hyperarousal model of insomnia: A review of the concept and its evidence. *Sleep Medicine Reviews* 2010; **14**(1):19–31. <https://doi.org/10.1016/j.smrv.2009.04.002>
15. Sargent C, Lastella M, Halson SL, Roach GD. The impact of training schedules on the sleep and fatigue of elite athletes. *Chronobiology International* 2014;**31**(10):1160–1168. <https://doi.org/10.3109/07420528.2014.957306>
16. Schaal K, Tafflet M, Nassif H, Thibault V, Pichard C, Alcotte M, Toussaint JF. Psychological balance in high level athletes: Gender-Based differences and sport-specific patterns. *PLoS ONE* 2011;**6**(5). <https://doi.org/10.1371/journal.pone.0019007>

P069

## INVESTIGATING THE IMPACT OF INSULIN RESISTANCE ON AGEING AND WELLBEING USING SLEEP AS A MODEL SYSTEM

<sup>1</sup>Gewei Zhu\*, <sup>2</sup>Michael Catt, <sup>3</sup>Kirstie Anderson, <sup>4</sup>David Gunn, <sup>1</sup>Mark Birch-Machin. <sup>1</sup>Dermatological sciences, Newcastle University, Newcastle Upon Tyne, UK; <sup>2</sup>National Innovation Centre for Ageing, Newcastle Upon Tyne, UK; <sup>3</sup>Department of Neurology, Royal Victoria Infirmary, Newcastle Upon Tyne, UK; <sup>4</sup>Unilever RandD, Colworth Science Park, UK

10.1136/bmjresp-2019-bssconf.69

Sleep controlled by the circadian rhythm is essential for many functions including energy conservation, memory consolidation and brain processing. Sleep duration and architecture changes with age. Sleep deprivation is very common in modern society and it has been identified as a major modifiable risk factor for many metabolic diseases.

A cross-sectional analysis was carried out on baseline data from the UK Biobank (n=82995). Sociodemographic, health-related and lifestyle information were collected using touch-screen questionnaires. Sleep and physical activity parameters were measured objectively using wrist-worn accelerometers (participants were aged 43–79 years). Sleep durations have been categorised into five groups. short sleepers: (1) <5 hours/night, (2) 5–6 hours/night, (3) 6–7 hours/night; normal sleepers: (4) 7–8 hours/night; long sleepers: (5) >8 hours/night.

Short objective sleep duration was associated with male gender, older age and lower social status. A greater proportion of males with a sleep duration <5 hours/night have very high risk waist circumference (>102cm) compared to normal and long sleepers (22.1%, 14.9%, 11.7%, 10.4% and 10.2%, respectively). A similar pattern was also seen in females (60.0%, 50.6%, 43.9%, 41.3% and 40.6%, respectively). The percentage of participants with cardiometabolic diseases is significantly lower in those who sleep between 6–8 hours/night compared to other short and long sleepers (34.8%, 27.7%, 26.0%, 25.9% and 29.1%, respectively). They also have better health ratings and less likely to have hypertension, diabetes and cardiovascular disease. Finally, those who sleep 6–7 hours were most physically active compared to others sleep groups. In conclusion, 6–8 hours of sleep per night is associated with better metabolic health and higher physical activity level. Short sleep duration is associated with male gender and social deprivation. Although, no causal link can be established from this study, the results can help to develop interventions for targeted groups to reduce the adverse effects of poor sleep.

P070

## CAN FAMILIAR SENSORY INPUTS REDUCE THE FIRST NIGHT EFFECT WHEN SLEEPING IN AN UNFAMILIAR HOTEL ROOM?

<sup>1</sup>Victoria Earl, <sup>1</sup>Mark Stratton, <sup>1</sup>Jonathan Guo, <sup>1</sup>Chang Kim, <sup>1,2</sup>Mary Morrell. <sup>1</sup>Clinical Research and Innovation Theme, Imperial College London, London, UK; <sup>2</sup>Academic Unit of Sleep and Ventilation, National Heart and Lung Institute, Imperial College London, Royal Brompton and Harefield National Health Service Foundation Trust, London, UK

10.1136/bmjresp-2019-bssconf.70

**Introduction** The first night effect (FNE) is the phenomenon of reduced sleep quality during the first night in a new environment. It is hypothesised that this is due to asymmetrical levels of activity in the two hemispheres of the brain to remain more vigilant. We aimed to determine whether the first night's stay in a hotel led to a reduction in sleep quality, and whether this could be mitigated by using one's own pillowcase.

**Methods** Participants were recruited with ethical approval via a questionnaire including a list of exclusion criteria. Participants then spent one night in the hotel room, followed by four nights at home. During the hotel stay the 'control group' used the hotel pillowcase and the 'intervention group' used their own pillowcase. Sleep quality was self-reported using a visual analogue scale, which was then converted into numerical data. Sleep quality at the hotel was compared to the mean quality at home. Additionally, hotel sleep quality was compared between the control and intervention groups. All data was analysed using a paired two-tailed t-test.