**Methods** 10 databases were searched for quantitative and qualitative English language articles reporting at least one of the behaviours and their impact on priori primary and secondary outcomes (figure 1) in adolescents (11-18 years) with type 1 diabetes. There were no restrictions on article publication dates or study design. Articles were subjected to title and abstract screening, full text screening, data extraction and quality assessment.

**Results** In total 9922 articles were identified from the initial search with 92 articles included for data extraction after title, abstract and full text screening, (figure 2). Data analysis is ongoing, where possible a meta-analysis (quantitative), meta-aggregation (qualitative) and mixed-methods synthesis (quantitative and qualitative narrative summary) will be conducted.

**Discussion** This extensive investigation on the full spectrum of 24-hour movement behaviours will identify the different, and perhaps complimentary, physiological and psychosocial impacts of each behaviour.

## REFERENCES


1. Cameron FJ, Garvey K, Hood KK, Acerini CL, Codner E. ISPAD Clinical Practice Consensus Guidelines 2018: Diabetes in adolescence. *Pediatr Diabetes* 2018;**19** Suppl 27:250-61.
2. Rollo S, Antsygina O, Tremblay MS. The whole day matters: Understanding 24-hour movement guideline adherence and relationships with health indicators across the lifespan. *J Sport Health Sci* 2020.


## 23 AHI DOES NOT ADEQUATELY REFLECT OSA SEVERITY

Emma Lombard*, Simon Merritt. *Conquest Hospital, East Sussex Healthcare NHS Trust, Hastings, UK*

10.1136/bmjresp-2021-bssconf.20

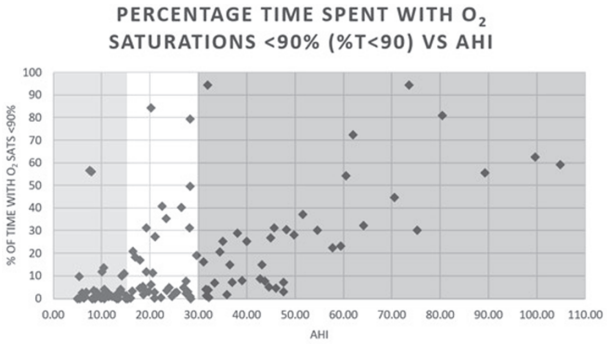
**Introduction** Obstructive sleep apnoea (OSA) results in significant cardiovascular consequences. Level of hypoxia and degree of sympathetic activation are postulated to play a role.

The Apnoea Hypopnoea Index (AHI) is used as a tool to assess severity of OSA. However, it does not measure depth or duration of hypoxia and may underestimate the risk of complications. The aim of this study was to evaluate the relationship between AHI and the burden of hypoxia.

**Method** This was a retrospective study, using data from nocturnal sleep studies. Equal numbers of each OSA severity, defined by AHI, were selected consecutively from 122 adult patients who underwent sleep studies between Dec 2020 and May 2021. Demographic data, AHI and percentage time spent with oxygen saturations <90% (%T<90%) were recorded. Excel was used for analysis and Spearman's rank used to calculate the correlation coefficient (rho, r).

**Result** AHI was compared to%T<90% (figure 1) showing a moderate positive correlation (r0.6). Subgroup analysis demonstrated a moderate correlation in the severe group (r0.67), whereas only a very weak correlation in the moderate and mild groups (r0.19 and 0.16 respectively). There was no significant difference in the%T<90% in the moderate group compared to those with an AHI 30-60 (mean(SD) 14.86 (20.15) and 17.96(17.91) P=0.067) despite these patients having different categories of OSA severity.

**Conclusion** This study suggests that AHI inadequately reflects degree of hypoxic burden, and therefore is an incomplete measure of OSA disease severity. The results demonstrate patients with moderate OSA have a burden of hypoxia similar to many of those with severe disease. In these patients, AHI may inadequately reflect the risk of future complications




**Abstract 23 Figure 1** Percentage time spent with $O_2$ saturations <90% (%T<90) vs AHI

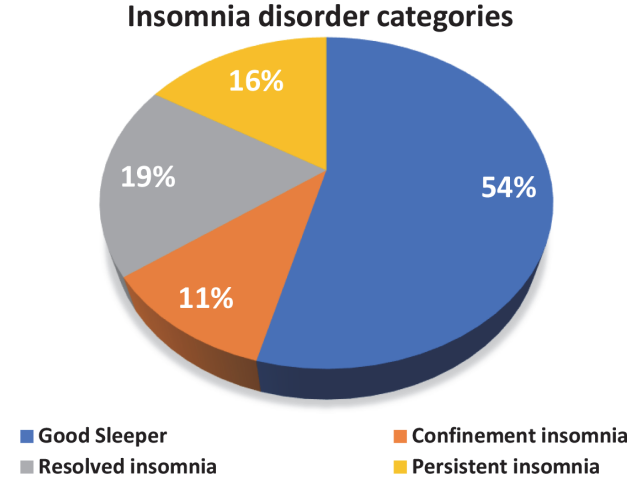
resulting from hypoxia. Further research is needed to develop an alternate measure of severity to accurately reflect this risk, a composite of AHI and hypoxic burden would be a first step.

## 24 INSOMNIA PREVALENCE IN CONFINED ELITE ATHLETES

Rui Pereira*, Iuliana Hartescu, Luke Gupta, Robin C Jackson, Kevin Morgan. *Loughborough University, Loughborough, UK*

10.1136/bmjresp-2021-bssconf.21

The demands of training, competition stress, and impact of frequent (inter)national travel are assumed to contribute to the shorter night-time sleep durations and poor overall sleep quality reported for elite athletes (1–3). However, systematically exploring this assumption is challenging, since a robust evaluation of sleep quality and practices in the presence and absence of sports participation would interrupt elite sports careers. The COVID-19 pandemic resulted in a cessation of international sport, and the home confinement of athletes. Using baseline data from an ongoing (pre-pandemic) study of athlete sleep, we compared the insomnia levels, sleep quantity and practices of elite athletes when exposed to, and deprived of




**Abstract 24 Figure 1** Insomnia disorder categories: good sleeper (did not score for insomnia disorder); resolved insomnia (scored for insomnia disorder in pre-confinement); confinement insomnia (scored for insomnia disorder in confinement); and persistent insomnia (scored for insomnia disorder in pre and during confinement)

**Abstract 24 Table 1** Descriptives on demographic, insomnia, and sleep factors (N=74)

| N=74 | Pre-Confinement (%/M(SD)) | Confinement (%/M(SD)) |
|---|---|---|
| Gender (female) | 68% | |
| Age (years) | 25.1 (4.4) | |
| Competition level (International) | 92% | |
| Insomnia symptoms | 75% | 49% |
| Insomnia disorder | 35% | 28% |
| Total sleep time (minutes) | 456 (49.8) \| 7h36mins | 490.8 (69.7) \| 8h10mins |
| Total time in bed (minutes) | 522.8 (49.9) \| 8h48min | 574.3 (71.9) \| 9h34min |
| Training load (minutes/daily) | 254 (72.5) \| 4h14min | 196.8 (81.4) \| 3h16min |

potential athlete-specific sleep risk factors of training, competition, and travel.

Participants (competition level $\geq$ national) completed baseline (prior to 23rd March 2020) and home confinement (commenced 5th May 2020) assessments. The 10-section online survey included: the PSQI; MCTQ (Munich Chronotype Questionnaire); rMEQ (Reduced Morningness-Eveningness Questionnaire; FIRST (Ford Insomnia Response to Stress Tests); PSAS-C (Pre-Sleep Arousal Scale-C); and GAD-7 (Generalised Anxiety Disorder 7-item scale), with additional expert-designed questions addressing sleep practices and DSM-5 insomnia symptoms.

Differences (N=74) between baseline and confinement responses were calculated with t-tests, Wilcoxon and McNemar's tests. There was a reduction in prevalence of insomnia symptoms (75% vs 49%; p=0.002) and insomnia disorder (35% vs 28%; p=0.286) during confinement. Increased during confinement was total sleep time (7h36min vs 8h10min; p<0.0001) and total time in bed before training days (8h48min vs 9h34min; p<0.0001). Training load (minutes/daily) was reduced (4h14min vs 3h16min; p<0.0001) in confinement (table 1). 19% of participants resolved pre-confinement insomnia disorder during confinement (figure 1).

During confinement, participants registered lowered prevalence of insomnia and training load. This research offers valuable insight on the insomnia profile of confined elite athletes, also addressing the role of the athletic lifestyle in insomnia prevalence.

## 25 PILOTING MODIFIED COGNITIVE BEHAVIOURAL THERAPY FOR INSOMNIA (CBT-I) IN A COMMUNITY MENTAL HEALTH TEAM (CMHT)

[1]Vinay Mandagere*, [2]Phoebe Whishart, [2]Jane Hicks. *[1]University of Bristol Medical School, Bristol, UK; [2]Avon and Wiltshire Mental Health NHS Partnership Trust, Bristol, UK*

10.1136/bmjresp-2021-bssconf.22

**Introduction** Cognitive Behavioural Therapy for Insomnia (CBT-I) is the first line therapy for insomnia, a common risk factor in psychiatry. We investigated whether piloting a CBT-I programme within a Community Mental Health Team (CMHT) improves insomnia symptoms. Our programme consisted mainly of Sleep Restriction Therapy (SRT) determined by individual chronotypes. CBT-I is currently under-resourced in the UK. To our knowledge, this was the first NHS programme in Bristol secondary mental health.

**Methods** 10 participants were recruited. Participants underwent a therapist guided initiation on (a) Sleep education (b) Sleep hygiene (c) Stimulus Control. Individual sleep windows were determined by the participants' chronotype: whether they were a 'morning lark' or 'evening owl'. Participants then underwent a 6-week course of Sleep Restriction Therapy (SRT). Weekly follow up focussed around motivation and explanation was either by phone or face-to-face due to the COVID-19 pandemic. Outcome measurements used pre- and post-intervention sleep diaries; as well as insomnia, depression (PHQ-9) and general health questionnaires (SF-36).

**Results** There was little improvement in Total Sleep Time (TST) (d= -0.84 hours) and patient-reported sleep quality (d= -0.67) following a 6-week course of modified CBT-I. Despite this, average number of mid-sleep awakenings roughly halved (47.9%). ISI, PHQ-9 and SF-36 questionnaires demonstrated no difference between pre-intervention and post-intervention scores. Unstructured interviews revealed that patients' thoughts and anxieties at night-time interfered with SRT.

**Conclusions** Our study suggests that modified CBT-I is a challenge for mental health populations. Solely SRT may not be sufficient to treat insomnia secondary to mental illness. Treating co-morbid insomnia may therefore require multi-component CBT-I to address sleep-related mental health issues, such as panic attacks, flashbacks and nightmares. CBT-I in secondary mental health services requires further development, with long-term follow up of patients to evaluate adherence to the programme and the behavioural changes needed.

## 26 RESPIRATORY ANNUAL REVIEW FOR CHILDREN & YOUNG PEOPLE WITH NEUROMUSCULAR CONDITIONS AND COMPLEX NEURODISABILITY: A PILOT STUDY

[1]Sairah Akbar, [1]Ruth Wakeman*, [1]Caroline Davies-Jones, [1]Joanne Gregory, [1]Alexander Thomas, [1]Bernadette Ortega, [2]Federica Trucco. *[1]Royal Brompton Hospital, Guys and St Thomas' NHS Foundation Trust, London, UK; [2]Department of Paediatric Neuroscience, Guy's and St Thomas' NHS Foundation Trust and Department of Paediatric Respiratory Medicine, Royal Brompton Hospital, London, UK*

10.1136/bmjresp-2021-bssconf.23

**Introduction** Children with complex neurological and neuromuscular conditions often have respiratory involvement requiring ventilatory support and multidisciplinary expertise due to their complexity.

To ensure patients' needs are met whilst minimising repeated hospital visits, an Annual Review (A/R) pathway was created to combine sleep study and multi-professional review within one admission.

**Method** Patients under our care with a scheduled in-patient sleep study were offered a full A/R as part of the pilot (August 2020-2021). Table 1 outlines investigations and reviews undertaken during A/R (tailored to the individual).