

# A pilot meta-analysis on concussion-related sleep disturbances

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## Background

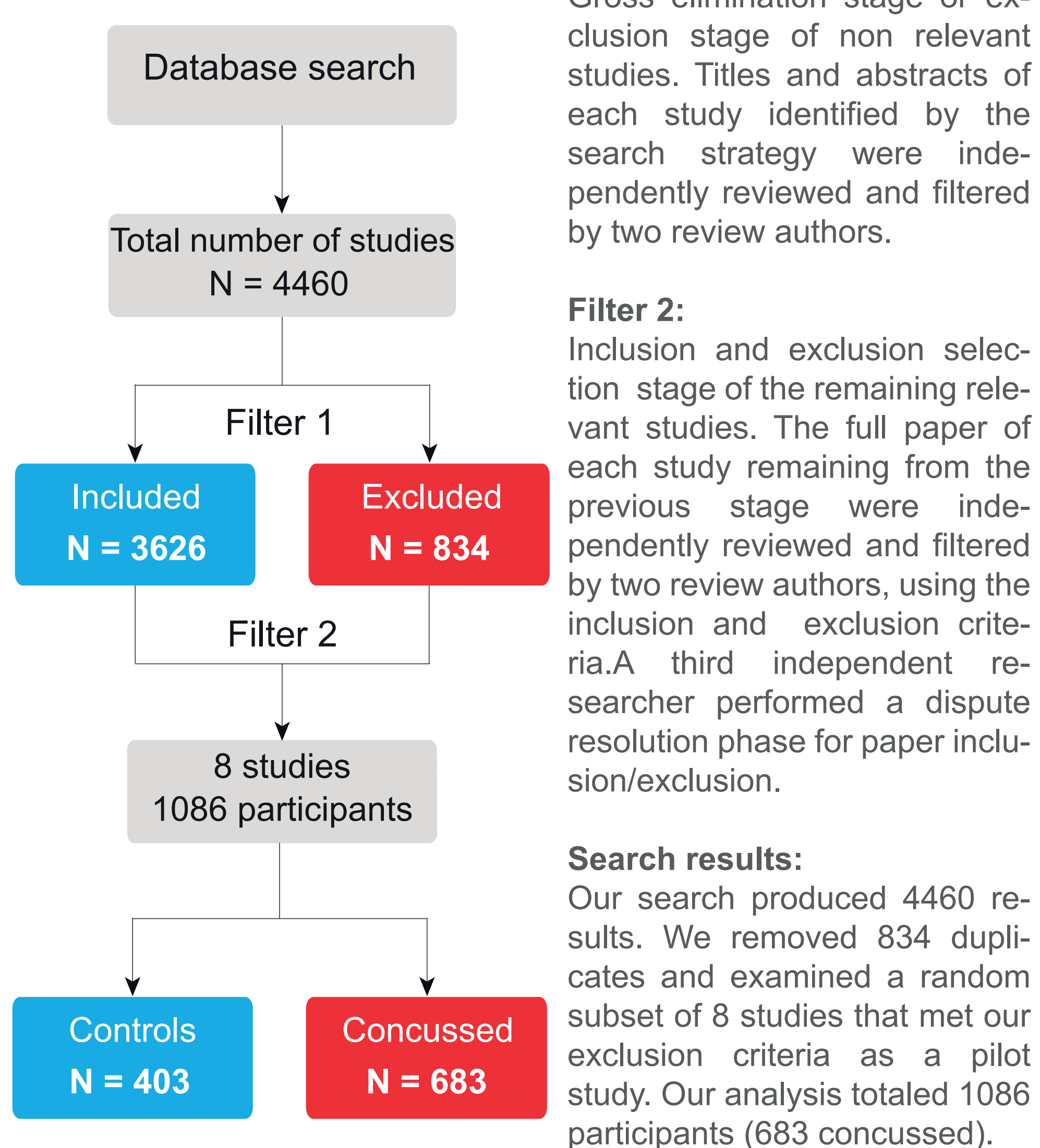
1. Fatigue and poor sleep have been shown as factors of post-concussive symptoms (Broshek et al., 2015).
2. Students, previously reported to have poor sleep, thus might be at increased risk of concussion-related sleep disturbances (McGrath et al., 2010).
3. This study explored the relationship between concussion and sleep, to serve as a pilot for a systematic meta-analysis.

## Method

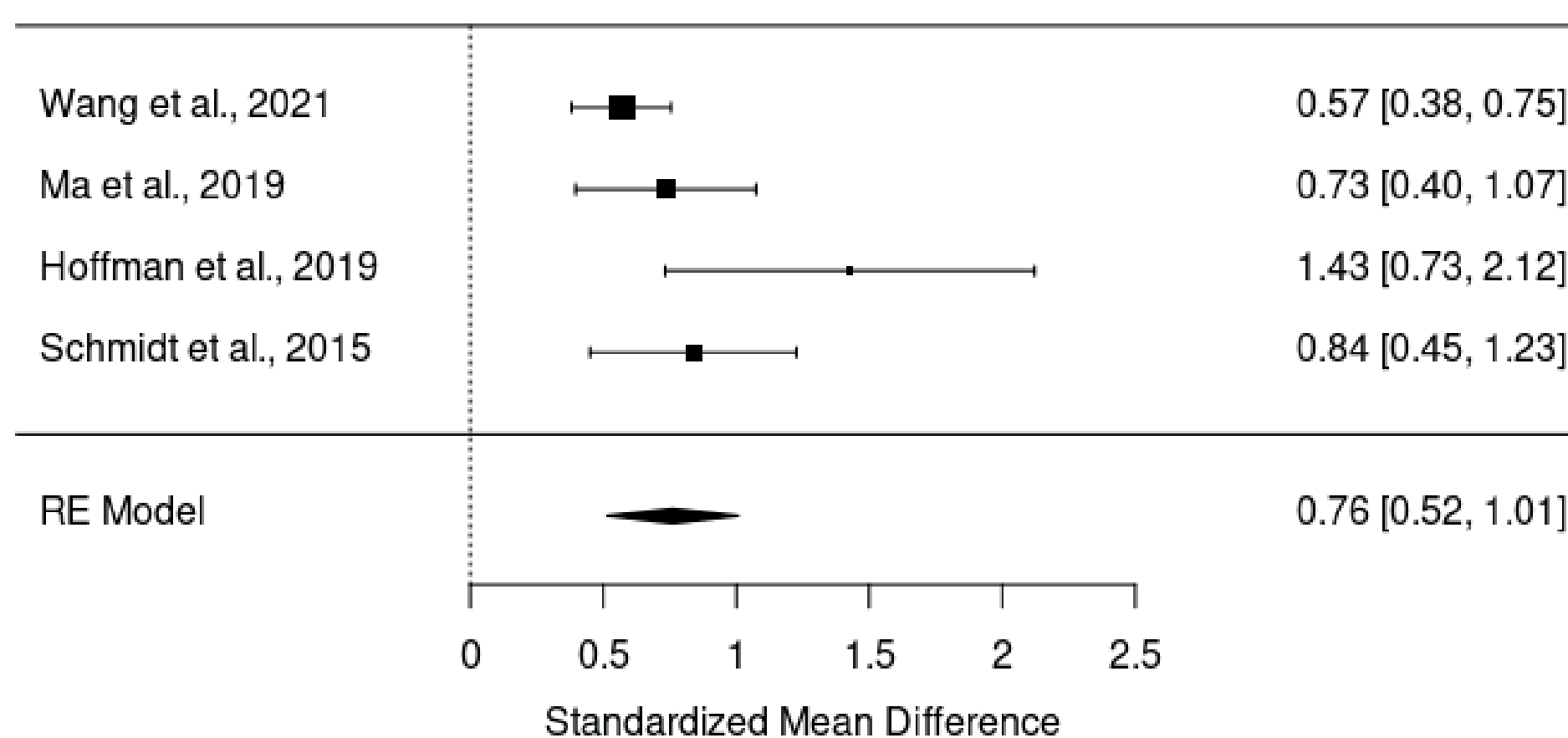
1. We searched the following databases MEDLINE, EMBASE, CINAHL, Web of Science, PsycINFO, Cochrane Central Register of Controlled Trials, MedNar and OALster with the search terms: sleep, concussion, mild traumatic brain injury, college/university and sports.
2. Only studies using the Epworth sleepiness scale (ESS) and the Pittsburgh sleep quality index (PSQI) were included.
3. Studies were excluded if they included non-human animals, patients with other neurological conditions or military personnel.

## Results

### Description of the search method and the dataset

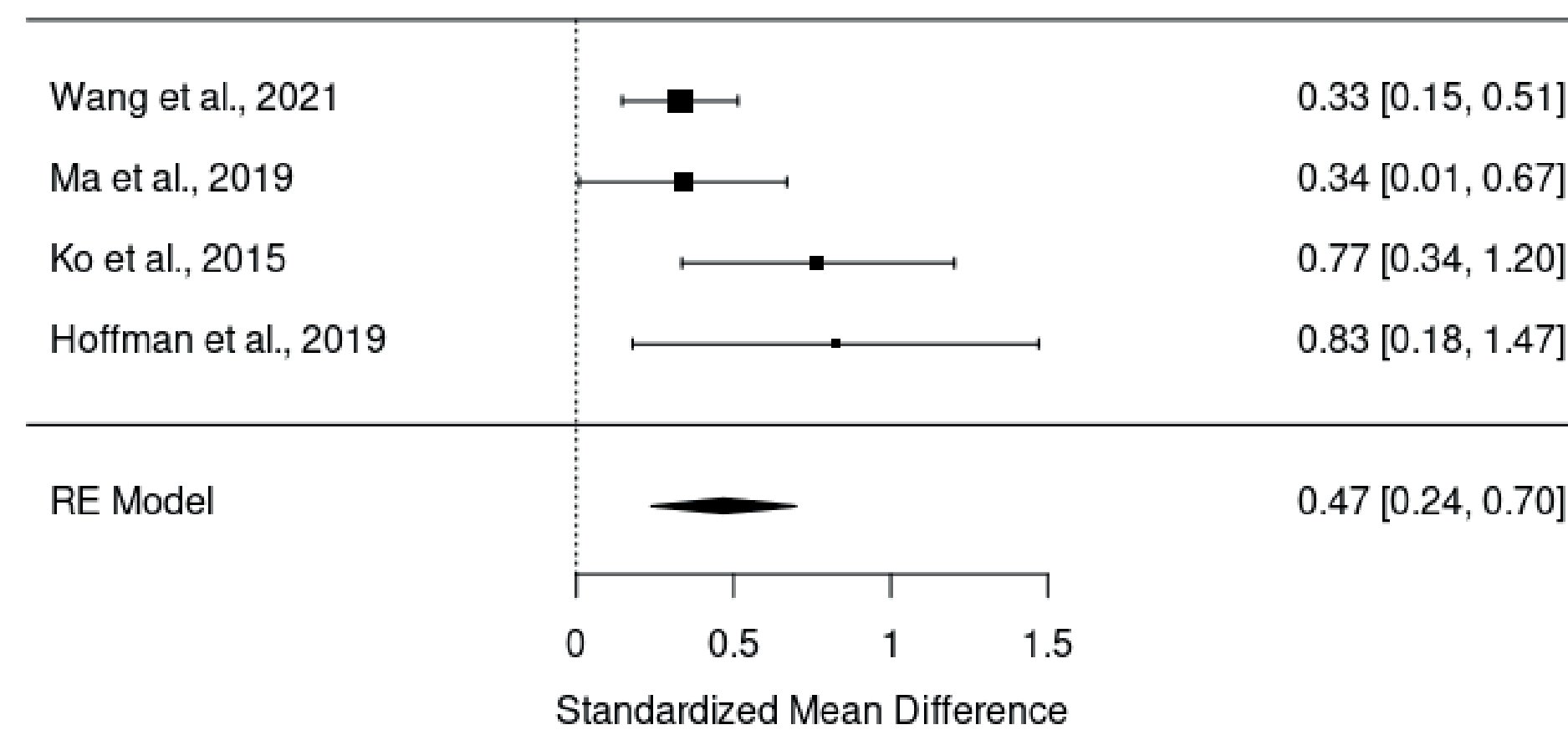


### Concussion or mild traumatic brain injury is associated with lower sleep quality



Using a random-effects model containing 4 studies per outcome test, we found that concussion was associated with increased PSQI (standardised mean difference: 0.76, 95% confidence intervals [0.52, 1.01],  $I^2$ : 0.03,  $p$  value < 0.0001).

### Concussion or mild traumatic brain injury is associated with increased sleepiness



Using a random-effects model containing 4 studies per outcome test, we found that concussion was associated with increased ESS (standardised mean difference: 0.47, 95% confidence intervals [0.24, 0.70],  $I^2$ : 0.02,  $p$  value < 0.0001).

## Conclusions

Our results suggest a diagnosis of concussion or mild traumatic brain injury is associated with lower sleep quality, as measured by PSQI, and sleepiness as measured by ESS, in this population.

### Future work:

Our research group will expand the parameters of our meta analysis to college students and athletes.

We will be expanding our search database to include the most up to date paper selection. We anticipate this expansion of our study criteria will allow for more studies to be assessed and further more detailed investigation of the associations between the link between concussion and sleep disturbance.

### References:

- Broshek, D.K., De Marco, A.P. and Freeman, J.R., 2015. A review of post-concussion syndrome and psychological factors associated with concussion. Brain injury.
- McGrath, N., 2010. Supporting the student-athlete's return to the classroom after a sport-related concussion. Journal of athletic training.

## About the ISC

### The International Sleep Charity (ISC) - Our team

We are a team of doctoral students, doctors and past sufferers of poor sleep. Members of our team mainly comes from UK universities, including the University of Cambridge and Imperial College London.

### Aims of the Charity

The International Sleep Charity (ISC) was founded in 2020. The ISC believes that everybody deserves a good night's sleep. Our mission is to help millions of people across the globe improve their health and well-being by sleeping better. We do this through facilitating a collaborative global platform for grassroots movements to use as a launchpad for their own groundbreaking, sleep-changing initiatives.

### Our main activities

Organise 'superstar' events led by world-leading sleep scientists on sleep. By learning more about the function of sleep, we will be able to sleep better.

Provide essential resources to everyone who wants to sleep better. Starting with free, clinically validated Cognitive Behavioural Therapy sessions for those that will benefit, kindly provided by our partners and donors.

Leverage the capability of graduate students and academics from leading research universities around the world. We will have a robust understanding of sleep research and technologies, with the aim of generating insights to inform public health.

Tackle broader social and environmental determinants impacting poor sleep by engaging with stakeholders to facilitate a good night's rest (e.g. replacing old mattresses and helping provide a safe place to sleep).

Find out more [internationalsleepcharity.org/about](https://internationalsleepcharity.org/about)



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