

The Tale of Orthosomnia: I Am so Good at Sleeping that I Can Do It with My Eyes Closed and My Fitness Tracker on Me

Haitham Jahrami ^{1,2}, Khaled Trabelsi^{3,4}, Michael V Vitiello ⁵, Ahmed S BaHammam ^{6,7}

¹Department of Psychiatry, Ministry of Health, Manama, Kingdom of Bahrain; ²Department of Psychiatry, College of Medicine and Medical Sciences, Arabian Gulf University, Manama, Kingdom of Bahrain; ³High Institute of Sport and Physical Education of Sfax, University of Sfax, Sfax, 3000, Tunisia; ⁴Research Laboratory: Education, Motricity, Sport and Health, EM2S, LR19JS01, University of Sfax, Sfax, 3000, Tunisia; ⁵Department of Psychiatry & Behavioral Sciences, University of Washington, Seattle, WA, USA; ⁶Department of Medicine, College of Medicine, University Sleep Disorders Center, King Saud University, Riyadh, Saudi Arabia; ⁷The Strategic Technologies Program of the National Plan for Sciences and Technology and Innovation in the Kingdom of Saudi Arabia, Riyadh, Saudi Arabia

Correspondence: Haitham Jahrami, Department of Psychiatry, College of Medicine and Medical Sciences, Arabian Gulf University, P.O. Box 26671, Manama, Kingdom of Bahrain, Tel +973 17286334, Fax +973 17270637, Email HJahrami@health.gov.bh

While the use of wearable commercial fitness trackers or mobile phone technologies to learn about an individual's sleep quality grows more and more popular, some sleep experts worry that a preoccupation with such data may lead to poor sleep quality and the possible development of insomnia.¹ The obsessive pursuit of optimal sleep metrics based on fitness tracker or mobile phone app data is termed "orthosomnia",² coined by combining "ortho" referring to straight, right or proper, and "somnia" referring to sleep.¹ While insomnia and orthosomnia are both related to sleep, they are not at all synonymous. Insomnia is a diagnosable sleep disorder, whereas orthosomnia is a societal phenomenon, similar to "social jet lag", another societal phenomenon that is gaining considerable notoriety. The current understanding of orthosomnia and its components is quite limited, although several behaviors are typically associated with it. These behaviors include preoccupation with sleep tracker data, frequently checking the sleep tracker, and anxiety about disassociation from the technology. In short, orthosomnia can be viewed as the obsessive pursuit of ideal sleep, free from disturbances, with regular sleep cycles and a focus on the body's healing process.³

Nomophobia is defined as the fear of no access to mobile a phone is an emerging psychological condition (and a societal phenomenon).⁴ Our research group has documented a strong association between nomophobia and insomnia.⁴⁻⁷ The link between nomophobia and insomnia may provide some insight into orthosomnia. The first and most important behavior associated with orthosomnia is that individuals suffering from it often and incorrectly assume that their sleep trackers are "perfect", so they spend an unusual amount of time in bed striving to enhance that data. It is important to recognize that consumer sleep technology (CST) trackers are only data recorders and not standalone technology. A mobile phone is necessary to read and report the sleep data from the tracker; therefore, it is valid to assume that the orthosomnia obsession is likely to include mobile phones and with their use experience nomophobia.

Individuals with orthosomnia may manifest insomnia-like symptoms while obsessing about "perfect sleep" because they are concerned with improving the CST's sleep statistics. As a result, those with orthosomnia are likely to exhibit the following symptoms: difficulty falling asleep at night, waking up throughout the night, waking up too early, not feeling well-rested after a night's sleep, tiredness or drowsiness during the day, anger, despair, or anxiety, difficulties paying attention, focusing on activities, or remembering, as well as an increase in mistakes or accidents, that is the typical symptom profile of insomnia.^{1,3,8-10}

Although some studies demonstrated no observed adverse effects of CST on sleep,¹¹ those studies did not assess the potential negative effects of using sleep trackers, such as orthosomnia, resulting in measurement bias and selective reporting of sleep results only reporting benefits. This stresses the importance of developing a validated measurement for potential negative effects and consequences on sleep while using CST devices.

In their case series report, Baron et al discussed three orthosomnia cases;¹ The authors noted that these cases present unique challenges in Cognitive Behavioral Therapy for Insomnia (CBT-I) and exacerbate sleep-related anxiety or perfectionism in some patients.¹ There was a perception of insufficient sleep by each patient as well as periods of restlessness or light sleeping.² Despite several validation studies having shown that CST tracking devices fail to discriminate sleep stages accurately and have poor accuracy in detecting wakefulness,³ Baron et al found their patients' perceptions difficult to alter.² Another study had two groups; group 1 included 30 individuals whose sleep was monitored via a sleep-tracking device for a week, and group 2 were 45 participants who had been using a sleep-tracking device for a month to two years.³ Assessment of participants of both groups underscored trends of anxiety related to aiming for perfect sleep with a resultant extension of bedtime to increase sleep scores and attempts to remove any in-bed activity that might decrease sleep scores.³

An important consideration here is that monitoring any biological body signal may create in some individuals a "mental health concern" of targeting perfection; this is supported by data from studies on patients with diabetes mellitus who use continuous glucose monitors. Constant glucose data availability may result in greater concern about glucose levels, worry, psychological distress, and poorer communication regarding blood glucose levels.¹²⁻¹⁴

Therefore, could the widespread practice of self-monitoring of sleep using CST leads to a sleep paradox, in which preoccupation with perfect sleep induces stress, anxiety and arousal, compromising rather than improving sleep?

As sleep specialists, we are concerned orthosomnia may harm an individuals sleep quality in the long term. This may occur for several reasons. First, individuals may overestimate the accuracy and reliability of their sleep tracker or mobile phone app data, which can lead them to misunderstand how well they sleep. Second, efforts to maximize CST measured sleep may result in anxiety and arousal based worsening of sleep. Third, reliance on CST may delay their seeking appropriate professional services before the problems become deep-rooted. Individuals may disregard the need for sleep studies if they become accustomed to relying solely on their sleep tracker instead of formal sleep studies (polysomnography or actigraphy), which are widely regarded as the most accurate source of detailed sleep data. These poorly conceived and poorly guided attempts to improve or maximize sleep are likely to make it worse. Even worse is the possibility of recommending similar tactics to friends and family members of persons who suffer from orthosomnia.

The development of a validated scale to measure unhealthy sleep obsessions is a work in progress.¹⁵ Developing a scientifically validated scale is particularly important in studying this new emerging condition. Such a scale could also provide useful therapeutic information to sleep medicine practitioners who might find themselves attempting to treat such individuals.

We suspect that many of our patients were experiencing an orthosomnia-like condition in the sense that they did not always fit the traditional definition of insomnia or hypersomnia but were nonetheless experiencing disturbed sleep because of worries about the information provided by their sleep-tracking devices and their efforts to improve their sleep accordingly.

To conclude, taking care of one's sleep health is never a negative, but doing so with inadequate knowledge may be potentially harmful. It has been estimated that 90% of adults own a smart phone of some type, and about 20% own a fitness tracker. CST is rapidly evolving and will likely increase in use. Although CST technologies have the potential to offer crucial information about irregular circadian rhythms and long-term sleep habits, relying solely on algorithms from modern technology with inexperienced interpretation might lead to poor management of sleep issues that results in disturbed sleep or exacerbates undiagnosed conditions. Therefore, considerable research about CST utility and disutility needs to be done. Sleep tracking using CST can be viewed in a manner similar to how positive airway pressure device downloads are already utilized in clinical sleep medicine, with a significant positive impact on adherence to therapy. Therefore, long-term CST validation studies are essential, taking into consideration the evaluation of all potential adverse effects of this technology on sleep in healthy subjects and patients with insomnia and other sleep disorders, using validated assessment measures. Additionally, during CBT-I, the therapist should review the benefits and downsides of tracking sleep when interviewing patients interested in utilizing a sleep tracker to monitor their sleep. Moreover, assessing if CST-generated reports affects treatment adherence or generates debilitating anxiety should be reviewed with each patient as an essential part of their treatment.

Disclosure

The authors report no conflicts of interest in this work.

References

1. Baron KG, Abbott S, Jao N, Manalo N, Mullen R. Orthosomnia: are some patients taking the quantified self too far? *J Clin Sleep Med.* 2017;13(2):351–354. doi:10.5664/jcsm.6472
2. Baron KG. CBT-I for patients with orthosomnia. In: *Adapting Cognitive Behavioral Therapy for Insomnia.* Elsevier; 2022:135–145.
3. Aupetit S, Dubroca G, Escaich S, Cabon P. A qualitative study of sleep trackers usage: evidence of orthosomnia. In: Charles R, Golightly D, editors. *Contemporary Ergonomics and Human Factors.* CIEHF; 2019:1–7.
4. Jahrami H, Abdelaziz A, Binsanad L, et al. The association between symptoms of nomophobia, insomnia and food addiction among young adults: findings of an exploratory cross-sectional survey. *Int J Environ Res Public Health.* 2021;18(2). doi:10.3390/ijerph18020711
5. Jahrami H, Fekih-Romdhane F, Saif Z, et al. A social media outage was associated with a surge in nomophobia, and the magnitude of change in nomophobia during the outage was associated with baseline insomnia. *Clocks Sleep.* 2022;4(4):508–519. doi:10.3390/clockssleep4040040
6. Jahrami HA, Fekih-Romdhane F, Saif ZQ, et al. Sleep dissatisfaction is a potential marker for nomophobia in adults. *Sleep Med.* 2022;98:152–157. doi:10.1016/j.sleep.2022.07.001
7. Jahrami H, Rashed M, AlRasheed MM, et al. Nomophobia is associated with insomnia but not with age, sex, BMI, or mobile phone screen size in young adults. *Nat Sci Sleep.* 2021;13:1931–1941. doi:10.2147/nss.S335462
8. Gaunt K, Nacsa J, Penz M. Baby lucent: pitfalls of applying quantified self to baby products. In: *CHI'14 Extended Abstracts on Human Factors in Computing Systems.* Elsevier; 2014:263–268.
9. Wang J, O’Kane AA, Newhouse N, Sethu-Jones GR, De Barbaro K. Quantified baby: parenting and the use of a baby wearable in the wild. *Proc ACM Hum-Comput Interact.* 2017;1:1–19.
10. Glazer Baron K, Culnan E, Duffecy J, et al. How are consumer sleep technology data being used to deliver behavioral sleep medicine interventions? A systematic review. *Behav Sleep Med.* 2022;20(2):173–187. doi:10.1080/15402002.2021.1898397
11. Arroyo AC, Zawadzki MJ. The implementation of behavior change techniques in mHealth apps for sleep: systematic review. *JMIR Mhealth Uhealth.* 2022;10(4):e33527. doi:10.2196/33527
12. Smith MB, Albanese-O’Neill A, Macieira TGR, et al. Human factors associated with continuous glucose monitor use in patients with diabetes: a systematic review. *Diabetes Technol Ther.* 2019;21(10):589–601. doi:10.1089/dia.2019.0136
13. Murata T, Kuroda A, Matsuhisa M, et al. Predictive factors of the adherence to real-time continuous glucose monitoring sensors: a prospective observational study (PARCS STUDY). *J Diabetes Sci Technol.* 2021;15(5):1084–1092. doi:10.1177/1932296820939204
14. Tanenbaum ML, Messer LH, Wu CA, et al. Help when you need it: perspectives of adults with T1D on the support and training they would have wanted when starting CGM. *Diabetes Res Clin Pract.* 2021;180:109048. doi:10.1016/j.diabres.2021.109048
15. Van den Bulck J. Chronorexia and Orthosomnia: towards the development of scales to measure unhealthy obsessions with sleep. *Sleep Med.* 2022;100:S29. doi:10.1016/j.sleep.2022.05.091

Nature and Science of Sleep

Dovepress

Publish your work in this journal

Nature and Science of Sleep is an international, peer-reviewed, open access journal covering all aspects of sleep science and sleep medicine, including the neurophysiology and functions of sleep, the genetics of sleep, sleep and society, biological rhythms, dreaming, sleep disorders and therapy, and strategies to optimize healthy sleep. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/nature-and-science-of-sleep-journal>