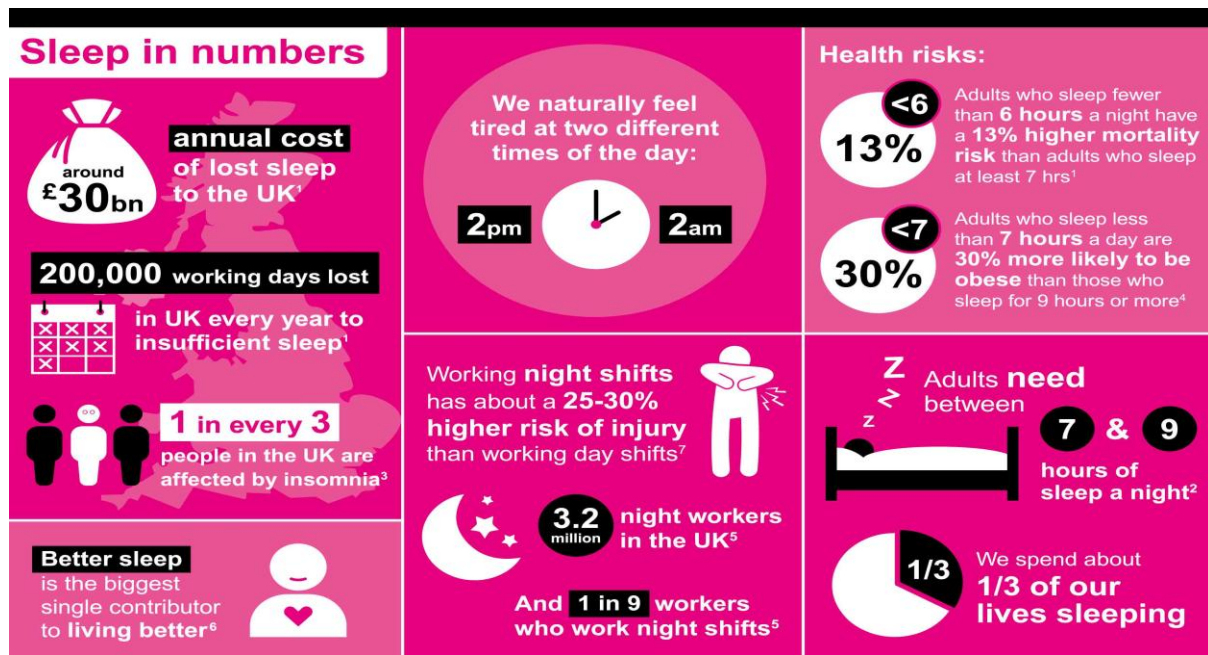


Blog-1: Digital Health Promotion: The Impact of Sleepio (NHS-endorsed digital CBT-I) on Unhealthy Sleep Patterns

Introduction: Why Unhealthy Sleep Patterns Are a Public Health Concern



1 RAND Europe • 2 NHS Livewell • 3 NHS Choices • 4 One You • 5 TUC • 6 Sainsbury's Living Well Index • 7 IOSH

(UK Health Security Agency 2018)

Unhealthy sleep patterns- including short sleep duration, irregular sleep routines, and poor sleep quality have become a significant public health concern in the UK. The NHS states that adults generally require 7–9 hours of sleep each night for physical and mental wellbeing (NHS, 2023). However, recent national data show that one in three adults report inadequate or poor-quality sleep, influenced by factors such as stress, excessive screen time, and lifestyle pressures (ONS, 2022). Globally, the World Health Organization warns that insufficient sleep is associated with increased risk of cardiovascular disease, diabetes, depression, obesity, and weakened immunity (WHO, 2021). Poor sleep also contributes to reduced productivity and higher accident risk, creating both personal and societal burdens. Due to these wide-ranging health implications, unhealthy sleep patterns represent a growing public health priority.

Digital Technology: Sleepio as a Digital Intervention

Sleepio is a digital cognitive behavioural therapy for insomnia (CBT-I) programme recommended by the NHS and NICE as a clinically effective intervention for improving sleep (NICE, 2020). The programme delivers a structured six-week course through a mobile or web-based platform, featuring tools such as sleep diaries, cognitive restructuring exercises, sleep restriction therapy, relaxation training, and personalised automated guidance (NHS Digital, 2022). Sleepio uses a virtual “digital therapist” to provide tailored feedback, enabling users to track their progress and adopt healthier sleep behaviours.



(The Sleep Doctor, 2025)

Evidence of Effectiveness

Evidence strongly supports the effectiveness of Sleepio in digital health promotion. A large-scale NHS evaluation found that Sleepio reduced primary care costs by £6.64 per patient, primarily due to reductions in GP consultations and sleep-medication

prescriptions (NHS Digital, 2022). Randomised controlled trials also demonstrate that Sleepio significantly improves sleep onset latency, reduces nighttime awakenings, and increases

Sleepio



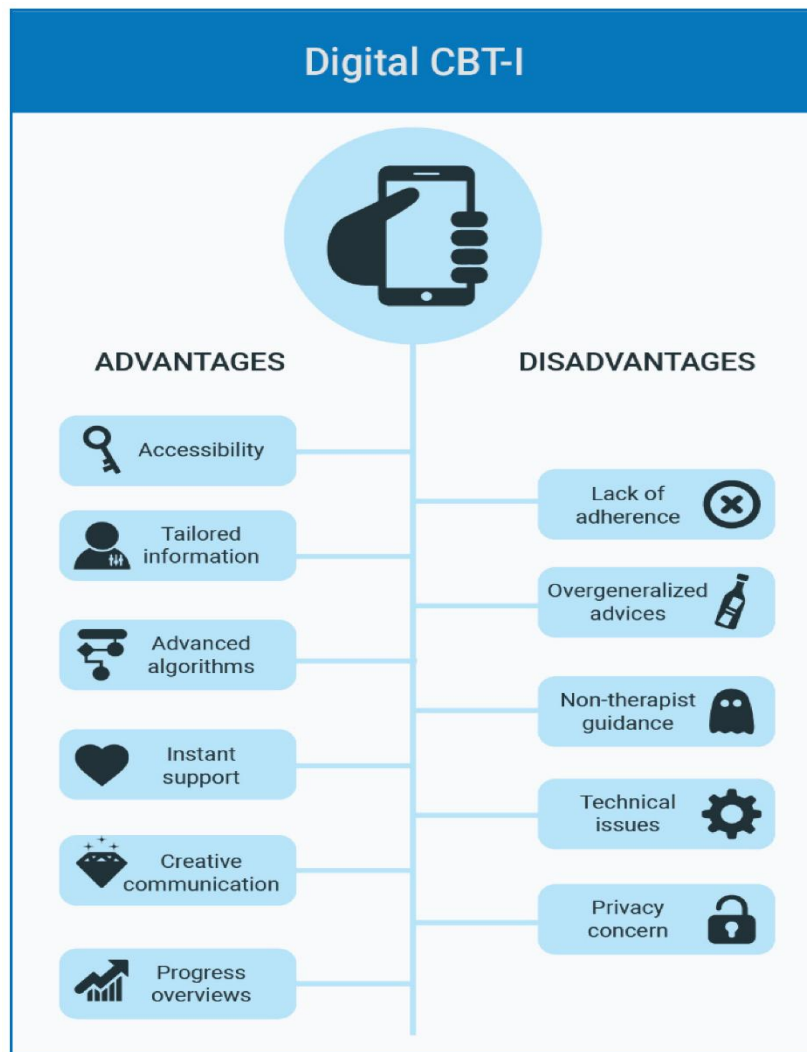
(Pharmaphorum, 2025)

overall sleep efficiency (Hertenstein et al., 2021). Furthermore, NICE reported that

Sleepio was more effective than treatment-as-usual in improving insomnia symptoms and therefore recommended its use in UK health systems (NICE, 2020).

Critical Discussion: Impact, Advantages and Limitations

Sleepio offers several advantages: it is accessible, cost-effective, and removes barriers such as long waiting lists and limited access to psychological therapies. The digital format allows users to engage flexibly with evidence-based CBT-I content



(NICE, 2020). However, limitations include the risk of digital inequalities, reduced long-term engagement, and limited suitability for individuals with complex mental health conditions or comorbidities (WHO, 2021; ONS, 2022). These shortfalls could be addressed by incorporating blended support models, simplifying app design for low-literacy users, and integrating Sleepio with primary care pathways for patients requiring additional support.

(Uyumaz, Feijs and Hu, 2021)

Conclusion:

Overall, Sleepio demonstrates that digital CBT-I can effectively improve sleep health at a population level, but its full impact depends on addressing digital inequality and ensuring blended support for those with complex needs.

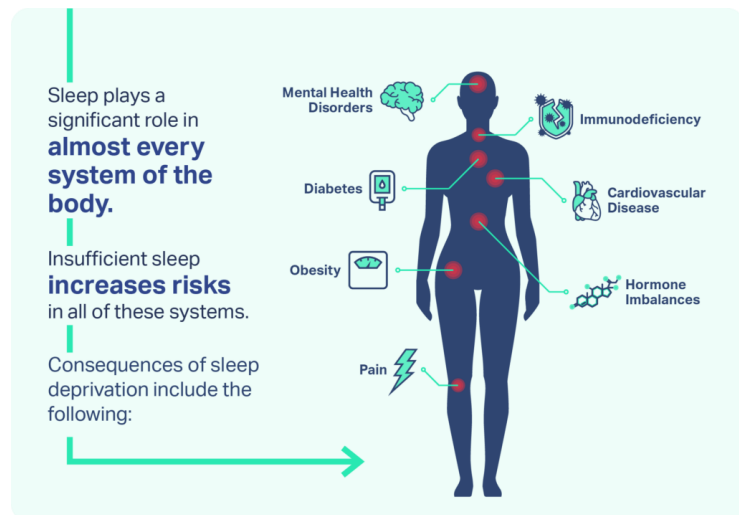
BLOG 2: The Impact of SleepSense+: A Designed Digital Technology for Improving Sleep Health

Introduction: Why Poor Sleep Is a Public Health Problem

Poor sleep remains an increasingly significant public health challenge in the UK, affecting physical, cognitive, and emotional wellbeing. Public Health England reports that insufficient or poor-quality sleep is linked to higher risks of obesity, impaired immunity, depression, and metabolic

disorders (PHE, 2021). Recent UKHSA data further indicate that irregular sleep and prolonged nighttime

screen use are rising among young adults, contributing to heightened stress and reduced daytime functioning (UKHSA, 2023). International epidemiological findings also show that short sleep duration contributes to the global burden of disease, particularly through increased cardiovascular and mental health risks (GBD Collaborators, 2022). These consequences highlight the urgent need for accessible, innovative interventions to support better sleep behaviours.



(Sleep Foundation 2025)

Designed Technology: SleepSense+

To address this issue, I designed **SleepSense+**, an integrated digital sleep-health system combining a mobile app with a wearable biofeedback patch. The patch monitors physiological indicators such as heart-rate variability, peripheral temperature, environmental noise, and movement. Data synchronises with the app, which uses

machine-learning algorithms to generate individualised feedback and behavioural recommendations.



(Toch Sleepsens, 2025)

integrating monitoring with behavioural coaching.

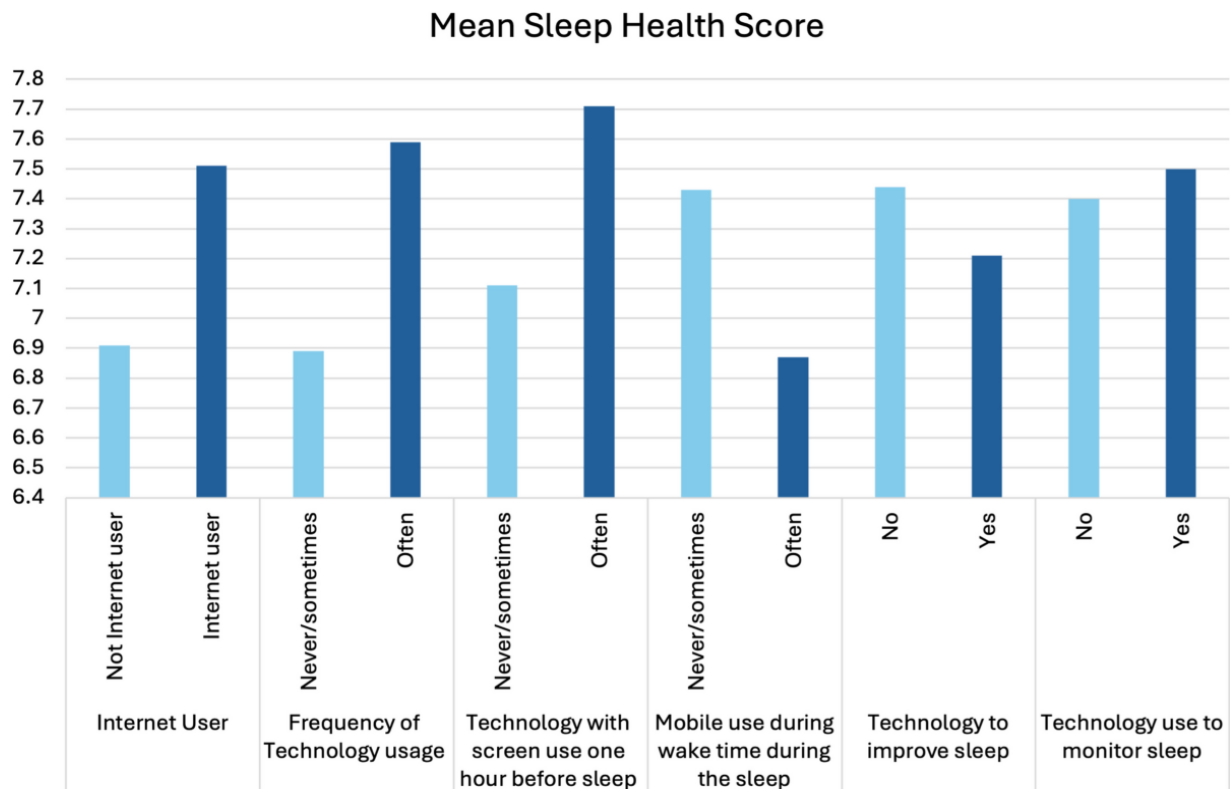
SleepSense+ includes:

- Circadian rhythm-guided scheduling
- Blue-light risk detection using device-based light sensors
- Adaptive sleep hygiene plans
- Micro-CBT sleep modules for anxiety-related sleep disturbances
- Biofeedback-based relaxation training

This design goes beyond existing tools by environmental and physiological

How SleepSense+ Promotes Health and Addresses the Public Health Problem

SleepSense+ supports health promotion by empowering users to self-manage sleep behaviours. The app identifies sleep-disrupting patterns (e.g., late caffeine intake, excess screen exposure, irregular bedtimes) and provides automated behavioural prompts. This aligns with evidence demonstrating that personalised feedback and self-monitoring can improve sleep quality and reduce insomnia symptoms (Ritterband et al., 2022). The wearable patch enables users to visualise environmental factors such as temperature and noise, which play a critical role in sleep quality (British Sleep Society, 2023).



(Ghazi et al. 2025)

By increasing awareness, strengthening sleep hygiene, and encouraging behavioural change, SleepSense+ directly addresses the factors contributing to poor sleep patterns among young adults and the wider population.

Critical Discussion: Advantages and Shortfalls

SleepSense+ offers several strengths: real-time physiological monitoring, personalised recommendations, accessibility, and integration of CBT-based micro-



interventions. Such multi-component interventions have been shown to support sustained sleep improvements (Espie and Kyle, 2020).

(Pearce, 2022)

However, shortfalls include potential financial barriers associated with wearable devices, data-privacy concerns, and possible user disengagement once the novelty wears off. Additionally, individuals with severe mental health disorders may require clinical treatment rather than app-based support (Royal College of Psychiatrists, 2022).

These limitations can be addressed by:

- Offering low-cost or NHS-supported wearables
- Applying strong encryption and transparent data policies
- Providing simplified “low-interaction” modes
- Including automatic referral prompts for users showing red-flag symptoms

Conclusion:

SleepSense+ shows strong potential to transform sleep health through personalised, evidence-based support, and with strengthened accessibility and data protections, it can make better sleep achievable for a wider population.

Combined Reference List (Blog-1 + Blog-2)

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