



Sleep and our
Mental Health

Oct 2020

Taking Sleep Seriously



Executive Summary

Sleep is integral to all aspects of our lives, yet sleep is often one of the first things we compromise when things become busy or overwhelming. Often our lives and daily routines, schools, workplaces and home or community environments are not structured in ways that value and prioritise the importance of good sleep.

Sleep is a critical component of not just our physical health, but our mental health. In March 2020, the Mental Health Foundation commissioned two surveys on sleep and mental health from^a YouGov: one of 4,437 UK adults aged 18+^b and another of 2,412 GB teenagers aged 13-19.^b

In our surveys, nearly half

48%

of adults and two thirds of teenagers

66%

agreed that sleeping badly has a negative effect on their mental health.

Increased awareness of the importance of sleep, and systemic action on sleep, should be a priority.

Taking sleep seriously and understanding the many ways sleep interacts with our lives can help us harness its potential as a powerful way to promote and protect good mental health for all. Our review of the existing research, alongside our new polling, highlights the important role sleep plays in the context of:

Mental health problems

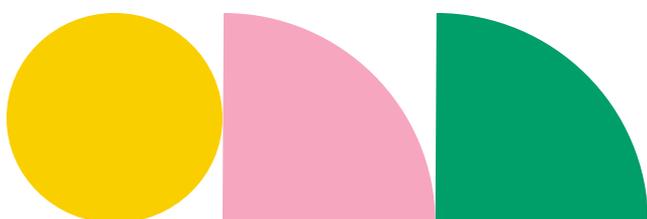
Sleep problems can be both a symptom of, and a contributor to, mental health problems. Treatment for sleep problems can help improve mental health. There is some evidence that treating sleep problems may help reduce depression symptoms in the general population, suggesting it may be an avenue for preventative mental health care.

Family

Parents (particularly mothers) of young children experience significant changes to the quality and quantity of their sleep which can affect parental mental health and contribute to stress in families. Bedtime routines can help to build good sleep habits in children from an early age.

School

Adolescents' routines, including school schedules, may affect the amount of sleep they get, which has implications for their mental health. School-based sleep education programmes can be used to increase student knowledge about the importance of sleep and how to develop healthy sleep habits.



Workplaces

The characteristics of a workplace affect our sleep and our mental health.

In our survey, 37% of working adults reported that their work (for example, workload, problems with colleagues and worries about job security) reduces the amount of control they feel they have over their sleep.

Employers should ensure they support good sleep and good mental health at work by promoting a choice of shift, offering healthy sleep programmes to staff, promoting a good work-life balance and consulting experts and worker representatives to develop flexible work schedules.

Social inequalities

There are inequalities in the quality and quantity of our sleep linked to our environment, race/ethnicity, socioeconomic status, financial stability, and experiences of trauma. In our survey, a quarter (25%) of UK adults reported that worrying about money matters, including bills, negatively affected their sleep in the past month. Of those who were unemployed, more than a quarter (27%) reported experiencing suicidal thoughts and feelings due to a lack of sleep.

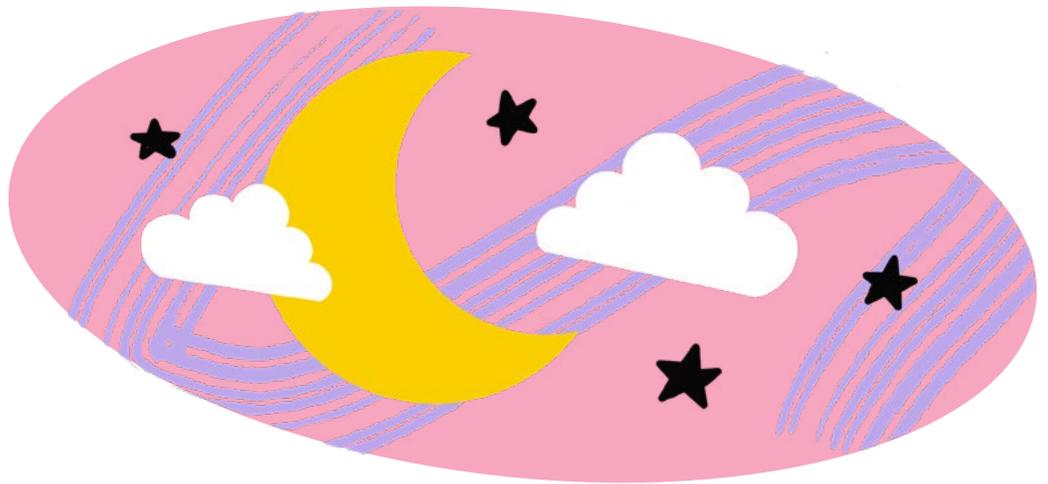
We recommend that:

Governments across the UK must incorporate sleep (including the prevention and treatment of sleep problems) into their mental health and wellbeing strategies – sleep is fundamental to good mental and physical health.

UK Research Councils must work with UK partners to fund research **to better understand the role of sleep as a central determinant of health and wellbeing, and of directly addressing poor sleep as a central component of mental health.**

While there are changes that can be made at a societal level to better recognise and prioritise sleep, there are also things each of us can start to work on today, as individuals, to support our own sleep and mental health. Professor Colin Espie, Professor of Sleep Medicine at the University of Oxford, shared with the Mental Health Foundation five principles for good sleep health, which are that we should:

- * **Value** our sleep as something crucial to our lives, and take our sleep seriously
- * **Prioritise** our sleep by putting sleep first when making choices about what we want to do
- * **Personalise** our sleep by finding the 'sleep window' that works best for us
- * **Trust** that sleep is a natural process and that our sleep will get itself into a good pattern
- * **Protect** our sleep by avoiding or preventing things that can upset it.



Sleep and COVID-19

Since we began work on this report, the coronavirus pandemic has changed all our lives.

We have experienced profound changes to our work, schooling, daily routines, and the way we interact with our friends, family, and support systems. These aspects of our lives are crucial for our mental health, and, as we outline in this report, for our sleep. In late April 2020, one month into lockdown, we surveyed 4,246 UK adults aged 18+ as part of wave three of the *Mental Health Foundation's Coronavirus: Mental Health in the Pandemic study*.¹ More than a quarter (26%) of UK adults said the coronavirus had negatively affected how well they slept in the previous two weeks.^a

While poor sleep may now be more common for many of us,² the impact of the COVID-19 crisis on sleep is not distributed equally. Mothers of young children unable to access support or childcare, those living in homes with restricted access to outdoor space or natural light, people experiencing financial difficulty, and key workers may all be at higher risk of sleep loss.^{3,4}

It is therefore now more important than ever to bring attention to the fundamental importance of sleep for our mental health.

What is sleep?

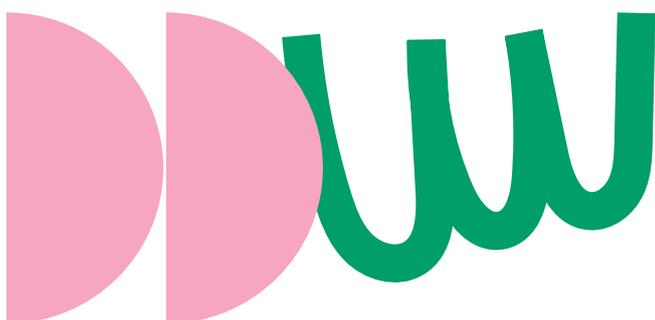
Dr Rachel Sharman and Professor Colin Espie

We are now living in a 24-hour society, where we can communicate and interact with others, anywhere in the world, at any moment of the day. It is then unsurprising that, for some, sleep becomes an afterthought, almost a burdensome chore to undertake between work and social commitments. However, there is a cost for not making time for sleep. In the words of renowned sleep scientist, Allan Rechtschaffen; "If sleep doesn't serve some vital function then it is the biggest mistake evolution ever made."

Why is sleep important for mental health?

We all know the feeling of heading to school or work after a poor night's sleep and the way that poor sleep can mean that molehills suddenly feel like mountains. Despite dedicating a third of our life to sleep, its absolute function is still largely unknown. However, we do know that sleep plays a central role in our learning, emotional regulation, behaviour, and how we interact with others – all of which might help to explain the vital role that sleep plays in our ability to interact and cope with the world around us.

Lack of sleep can affect our emotional regulation. Studies suggest that sleep deprivation may limit our ability to manage our responses to negative situations,⁵ with imaging studies showing changes in activity in the areas of the brain responsible for regulating our emotional memory processing and our body's response to emotional cues.⁶ For example, one study found that after a night of sleep deprivation, participants showed less emotional expressiveness when viewing both amusing and sad film clips⁷ and another found that individuals with insomnia (as compared to those without) demonstrated an impaired ability to recognise negative facial expressions.⁸



Sleep deprivation has also been linked to reduced impulse control, reduced positive thinking,⁹ and the expression of anger (though not physical aggression).¹⁰ Worryingly, it has also been found that there is a significant association between disturbed sleep and increased risk of suicidal ideation and attempt.¹¹ This may potentially be due in part to the emotional dysregulation and increased impulsivity that can result from sleep disturbance.¹²

The Mental Health Foundation commissioned a survey with YouGov in March 2020 of 4,437 UK adults aged 18+. In our survey, nearly half (48%) of adults agreed that sleeping badly has a negative effect on their mental health. Adults reported that they felt more irritable or angry (43%), more stressed and overwhelmed (42%), more anxious (35%) and more tearful (21%) in the previous month because of poor sleep.

Good sleep is therefore essential for our mental wellbeing. Impairments to sleep quantity and quality are associated with a range of mental health problems, such as major depression, anxiety disorders, schizophrenia, eating disorders, and borderline personality disorder.¹³ This is also the case for sleep problems such as insomnia.¹⁴ Studies have shown that improvements to sleep are associated with improvements in mental health and wellbeing. Large studies of digital sleep interventions (digital cognitive behavioural therapy for insomnia) have been proven to improve sleep in those with insomnia and have shown associations between improved sleep and improved mental health.^{15,16}

To more thoroughly understand the effect of poor sleep on mental health, it is important first to understand the physiological process driving sleep.

The science of sleep

There are two complementary processes, called '**process C**' and '**process S**', that promote stable sleep.¹⁷ The 'C' in process C stands for 'circadian', which refers to internal 24-hour rhythms in the physiology and behaviour of living creatures that help them to respond to changes in their environment. This rhythm occurs through changing levels of 'clock genes' found in almost every cell in the body. These levels fluctuate in a predictable way across 24 hours, which results in cycles of physiology and behaviour. Humans have a 'master biological clock' in a place in our brains called the suprachiasmatic nucleus (SCN). Similar to a conductor in an orchestra, the master clock co-ordinates all the cellular clocks in the body. The master clock relies on input from the external environment, for example light, to ensure it is correctly aligned to the external world. Any changes to this cellular machinery can shift the speed of our circadian rhythm, which can translate to changes in our sleep and behaviour patterns. A faster rhythm can drive someone to wake and sleep earlier – making them more of 'a morning type' or a 'lark', whereas a slower rhythm can drive someone to wake and sleep later, making them more of 'an evening type' or an 'owl'.

Process S works in a complementary way with process C and is sometimes called 'sleep pressure'. It refers to the increased need to sleep that we feel the longer that we spend awake. As this sleep pressure

Just like jetlag, the misalignment effect is felt more profoundly when time shifts later than when time shifts earlier.

builds, the circadian process increases the signal to stay awake, because it is the daytime, which opposes the increased need for sleep. However, as night approaches, the circadian drive for being awake reduces, and the accumulated sleep pressure takes over thus promoting stable sleep. We can of course fight the drive for sleep, for example by staying up late at night, however, our circadian rhythm will not alter, meaning our sleep rhythm will be misaligned with our internal body clock, similar to jet lag.

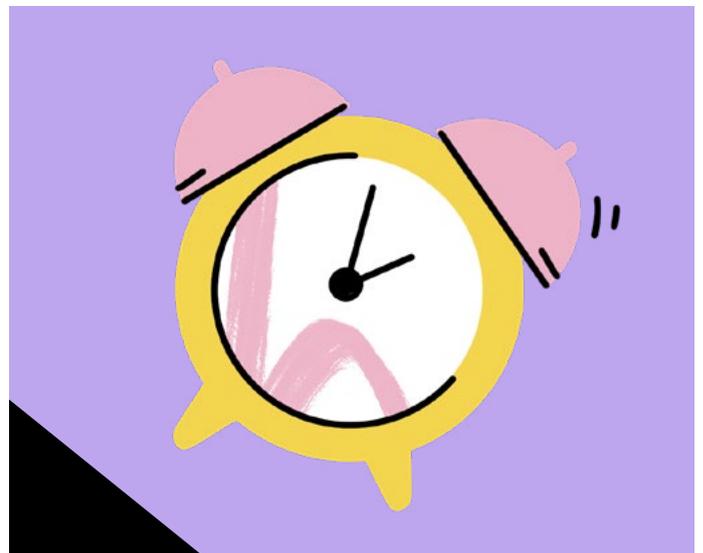
Natural changes in day times, with the seasonal clock changes, can result in temporary social jet lag as the circadian system adjusts to the new timing rhythm over a few days (using light and other environmental factors). Just like jetlag, the misalignment effect is felt more profoundly when time shifts later (for example, losing an hour of sleep or traveling eastward) than when time shifts earlier (for example, gaining an hour or travelling westward).

What is 'good quality' sleep?

Once we begin to fall asleep, there are distinct changes in our brain waves which cycle between two states every 90-120 minutes. These are non-rapid eye movement (NREM) sleep (itself composed of three stages from lighter sleep, stage one, to deeper, or slow-wave sleep, stage three) and rapid eye movement sleep (REM). In typical, healthy, adults we would expect that the first third of the night would be mostly NREM sleep, with the highest amount of deep sleep, giving way in the last third of the night to REM sleep and the lighter NREM sleep. The proportion of time spent in these sleep stages changes throughout development. For example, children have a higher proportion of deep sleep, stage three, than adults, with these deeper stages of sleep declining as we age.

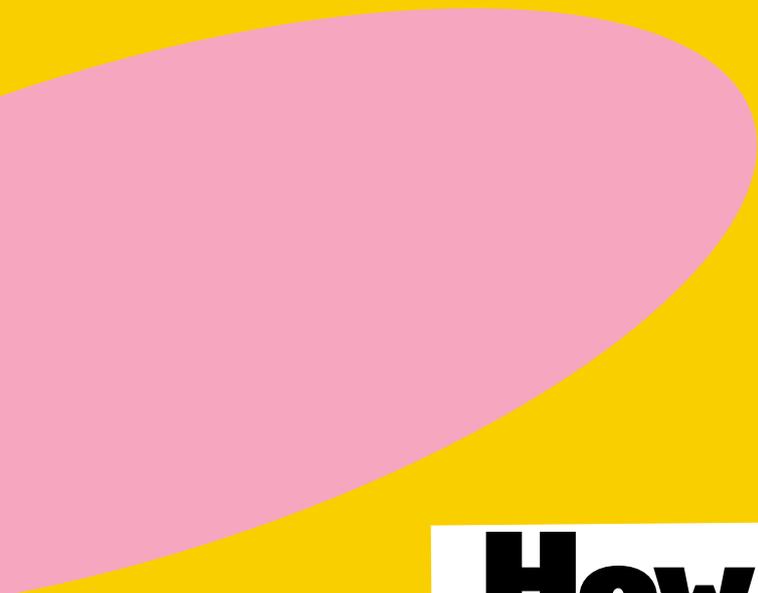
Sleep is said to be of good quality if the time it takes to fall asleep is less than

30 minutes, wakefulness once asleep is under 30 minutes, we achieve an age-adequate total sleep length, and the sleep efficiency - or percentage of time in bed spent asleep, is more than 85%.¹⁸ As the required amount of sleep needed for optimal functioning changes with age, the National Sleep Foundation provides guidelines for sleep duration at each stage of life, though individual sleep needs will vary person-to-person.¹⁹ Unsurprisingly, new-borns require the most sleep (14-17 hours), decreasing as children grow (9-11 hours for school-aged children, 8-10 hours for adolescents, and 7-9 hours for young adults). Adults up to 64 years of age are said to require 7-9 hours of sleep and older adults require slightly less, at 7-8 hours.



Summary

- * Sleep plays a vital role in our ability to cope with the world around us. It affects our learning, behaviour, ability to regulate our emotions, and our interactions with others.
- * Stable sleep is promoted by two complementary physiological processes, 'process C' (circadian rhythm) and 'process S' (sleep pressure).
- * Sleep is said to be of good quality if the time it takes to fall asleep is less than 30 minutes, wakefulness once asleep is under 30 minutes, we get an adequate length of sleep, and we spend 85% or more of our total time in bed asleep.
- * Impairments to sleep quantity and quality are associated with a range of mental health problems. Improvements in sleep problems are associated with improvements in mental health.



How does sleep affect our lives?

Given the importance of good quality sleep to our mental health, it is important to understand the steps that can be taken to improve and better value our sleep in many different aspects of our lives.





Sleep and Health

Sleep and mental health problems

Sleep and mental health problems are very closely related and disrupted sleep can be a causal factor, a symptom, and a consequence of mental health problems. For those living with existing mental health problems, sleep plays an important role in their ongoing mental health and wellbeing.

One review highlighted just how important people with severe and enduring mental health problems feel sleep is to their mental health, with people citing sleep symptoms as some of those that are more detrimental to their overall wellbeing.²⁰ Some felt the two were so strongly connected that it was difficult to distinguish between sleep symptoms and mental health symptoms, and yet the importance of sleep to their mental wellbeing was not always fully understood or acknowledged by family members or healthcare staff.²⁰ Interestingly, some people with a diagnosis of bipolar disorder felt the opposite, namely that psychiatrists tended to over-prioritise sleep problems as an indicator of relapse.²⁰ This may be due to research finding that sleep and circadian rhythm disturbances can precede bipolar episodes.²¹

Medications prescribed for mental health problems may also influence sleep, for example many antidepressants change levels of compounds in the brain that are not only involved in mood, but also in generating stable sleep. This can result in less stable sleep which can further complicate sleep quality.²²

It is clear that sleep plays a crucial and central role in the mental health and wellbeing of those living with mental health problems. Sleep problems, regardless of the presence of co-morbidities, may often require direct treatment.²⁰

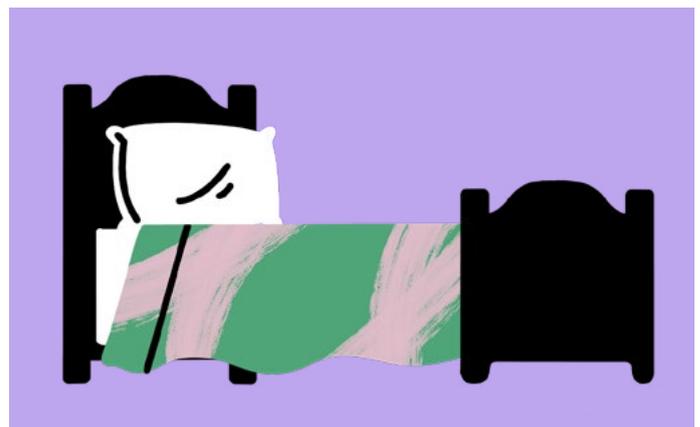
Treating sleep problems may itself improve mental health. Cognitive behavioural therapy for insomnia (CBT-I) is frequently

In our survey, more than

one in ten

(12%) UK adults reported that in the last month, a mental health problem and/or the side effects of a medication they take for it had negatively affected their sleep.

cited as a recommendation for improving sleep for people with common mental health problems such as depression and anxiety^{23–25} and there is evidence to suggest that treating sleep problems can improve depression symptoms.^{26,27} Sleep interventions may also serve as low-stigma preventative mental health care.^{27,28} For example, some studies have found that treating sleep problems may reduce depression symptoms in the general population.²⁷ Therefore, educating the public about the importance of sleep, and ensuring that effective treatment for sleep problems is easily accessible, could help improve sleep and, potentially in some cases, prevent the development of mental health problems.²⁹



Sleep and chronic physical health conditions

The relationship between physical health conditions and sleep is complex and often bi-directional. Sleep difficulties can be a symptom of some health conditions, but the symptoms of a health condition can also make it more difficult to sleep, all of which can influence wellbeing and mental health.

There is evidence to suggest that poor sleep in adults is associated with a range of chronic health conditions including coronary heart disease, asthma, stroke, kidney disease and diabetes.³⁰

More than half of the adults in our survey



51%

agreed that how they sleep affects their physical health.

Given the range of the conditions that can be considered chronic, and the fact that many individuals will have more than one chronic health condition, the ways that sleep and health interact are likely to differ between individuals and can relate to things such as prescribed medication, inflammation, changes in hormones, changes to the sleep-wake cycle, and experiences of chronic pain.³¹

Up to 90% of people with conditions associated with chronic pain report poor sleep, and, similarly, sleep disturbance may affect how chronic pain is perceived.^{25,32}

Regardless of the cause, sleep problems for people with chronic illnesses have been linked to an increased risk of anxiety and depression and reduced quality of life.³¹

In our survey 18% of adults said that a physical health condition or disability had negatively affected their sleep in the previous month. This was highest among adults aged 55 and older, of whom, 24% reported that a physical health condition or disability had negatively affected their sleep (compared to 8% of adults aged 18-24 and 12% of adults aged 25-34).

Sleep disturbances among older adults may be quite common, with one review finding that 31% of adults aged 60 and up reported sleep disturbances.³³ This is important because the relationship between mental health and sleep is maintained into older adulthood, with studies finding that self-reported sleep disturbances increase the risk of depression, and that depression increases the risk of developing sleep disturbances among older adults.³³ It is therefore important that healthcare professionals are able to identify and address sleep problems in their older adult patients.

Aside from a greater emphasis on screening and assessment for sleep problems in those with chronic health conditions,^{31,32,34} a concurrent management approach focused both on the physical health condition and sleep can lead to improvements in quality of life.³⁵ One review looked at sleep interventions such as face-to-face CBT-I for adults with cancer and chronic conditions such as arthritis and fibromyalgia (average ages ranged from 45 to 61). The review found that CBT-I interventions can have positive effects on sleep quality, pain, and depression symptoms.³⁶

Summary

- * Sleep and physical health strongly influence one another, and both can affect mental health. In our survey, more than half (51%) of adults agreed that how they sleep affects their physical health, and 18% said that a physical health condition or disability had negatively affected their sleep in the previous month.
- * There is a complex relationship between sleep and mental health problems. While sleep problems can be both a symptom and a consequence of mental health problems, they may also have a role in causing them. For those living with mental health problems sleep plays a crucial role in their mental health and wellbeing.
- * Treatment for sleep problems may help improve mental health. There is some evidence that treating sleep problems may help reduce depression symptoms in the general population, suggesting it may be an avenue for preventative mental health care.

Sleep and relationships

Research suggests that sleep difficulties are related to increased conflict within our relationships.³⁷ In our survey, 38% of adults agreed that how they sleep affects their relationships with other people in their lives. A lack of quality sleep may affect our ability to manage our relationships, as sleep loss is linked to changes in the way that we process emotions and emotional cues.³⁸ These changes may make us less able to communicate constructively with friends and family, contributing to conflict. In our survey, 14% of adults reported that poor sleep led them to have more rows with other people in the previous month. Indeed, studies have found that those who spend

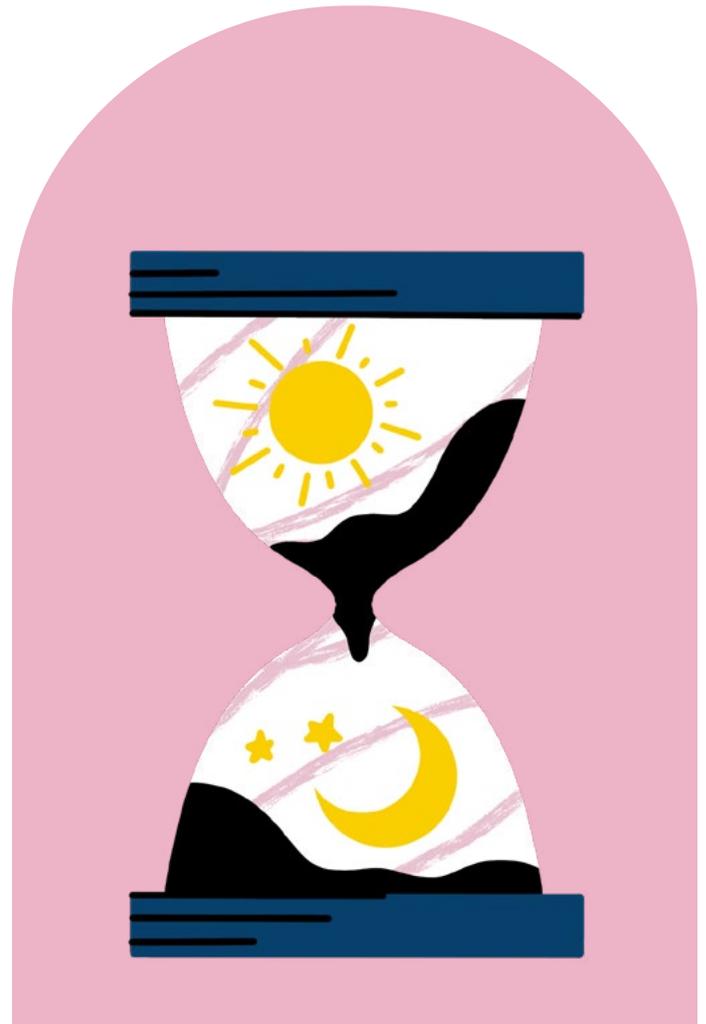
the night awake show impairments in their ability to share in the emotional state of images viewed as part of a computerised task.³⁹ In a real-life setting, partners were more likely to report increased conflict, and decreased empathetic accuracy when discussing relationship conflicts, when one or both reported poor sleep.⁴⁰

Social rhythms and routines

Our master clock, in the brain's SCN, uses environmental cues to better align our internal rhythm to that of the world around us. Bedtimes, waking times, light exposure, social interactions and mealtimes can all act as cues that tell our bodies what time of day it is and when it is time to prepare for sleep.⁴¹ Relationships and social engagements, be they in person or digitally, can also influence sleep by establishing routines that affect our body's circadian rhythm. For example, staying out late into the evening not only pushes our bedtime later than usual, but also exposes us to more evening light. This light may be falsely interpreted by our biological clock as daytime, delaying the circadian rhythm. In turn, this may make waking at the usual time the next day difficult, as our body clock may still think it is night.

Our wish to engage in social activities at specific times can sometimes be in direct contrast to our chronotype (for example a 'morning type' or 'evening type'). If these social routines conflict with our circadian rhythm, then we can experience a misalignment between our 'social clock' and our 'biological clock' which has implications for the quantity and quality of our sleep.⁴² We sleep better and deeper when the two processes are in synchrony. For many of us, external schedules for school, work, or

Our wish to engage in social activities at specific times can sometimes be in direct contrast to our chronotype.



social commitments can contribute to this misalignment, whereby the 'work' rhythm does not match that of the internal clock. This discrepancy is referred to as 'social jetlag' because it can mimic how we feel when we travel across time zones, but without actually leaving home.⁴² Social jetlag is associated with greater sleep debt, poorer attention and performance, and a range of health consequences including depression symptoms.^{42,43}

Providing regular social and environmental cues can help to bring the biological and social clock back in to alignment.⁴¹ For example, a regular bed/wake time and regular exposure to light patterns (high exposure in mornings and low in evenings) can regulate the biological clock and promote better quality sleep.

Parenting and parent-child relationships

The transition to parenthood is one example of a huge shift in social rhythms and routines and is associated with significant and nearly universal changes to sleep quality and quantity experienced by parents. This is particularly the case for the first few years of life: from birth, when infants require feeding every few hours, and through early childhood, when children may experience separation anxiety around bedtime, bedtime resistance, or difficulties with getting to bed or waking up during the night.⁴⁴ While both parents will experience disrupted sleep, mothers may experience more sustained, and very significant, disruption to their sleep.

Sleep difficulties for mothers can begin as early as pregnancy. Sleep loss and disrupted sleep is a common complaint among pregnant women^{45,46} and can exacerbate pre-existing sleep problems.⁴⁷ This may be due to a combination of the physical demands placed on the body by pregnancy (for example, finding it more difficult to find a comfortable position in which to sleep) and the stress or worry that can accompany the transition to parenthood.^{47,48} In our survey, nearly a quarter (23%) of women and one in ten men said that worrying about their children/being a parent negatively affected their sleep in the previous month.

Numerous studies have found a link between sleep difficulties in pregnancy and new motherhood and an increased risk of postnatal depression.^{49,50} Further, the sleep of mothers is closely linked to the sleep of their child. For example, the need to wake regularly for infant feeding can pose a significant challenge for women who struggle to fall asleep, as they will now need to undergo this process multiple times throughout the night.⁴⁷ Parents or caregivers of new-borns may also experience changes to their arousal threshold during, meaning they are more easily awakened, something which is

important for allowing them to listen out for cues from their baby.

Studies have, perhaps unsurprisingly, found that parental sleep quality and wellbeing is linked to their children's sleep.^{51,52} In our survey, 30% of adults with a child in their household said their child negatively affected their sleep in the previous month. Parents who experience frequent disturbances to their sleep may be more likely to report greater levels of stress, anxiety, and depression symptoms.⁵² They may also feel less able to cope, which in turn can contribute to marital conflict and/or reduced family functioning.^{51,52} This in itself has been linked to increased sleep difficulties in children, who in their turn will be vulnerable to the effects of sleep deprivation.⁵³

It is recommended that babies and children are provided with a consistent routine for bedtime that involves relaxing activities prior to bed, a consistent bedtime and waking time, a quiet, cool and dark environment to sleep in, and regular exercise and exposure to natural light during the day.^{44,54-56} An infant's circadian rhythm develops around three months post-partum and, just like an adult, needs regular exposure to environmental cues to keep it synchronised. Bedtime routines for infants, toddlers and young children often involve activities like reading or singing, which provide opportunities for bonding and early learning that may provide benefits beyond improved sleep and positive sleep habits.⁵⁷ However, for some families these routines may be difficult to establish consistently, particularly if parents work late-night or evening shifts. In these cases, tailoring the duration and components of the routine to the family context is important.⁵⁷ This may include things like creating a shorter routine that is easier to incorporate in to the family schedule. It is also important to ensure that when someone else is caring for your child at bedtime that they follow the same routines.

- * Our survey found that 38% of UK adults agree that how they sleep affects their relationships with other people.
- * Social routines can contribute to 'social jetlag' if they conflict with our body's circadian rhythms, something which has been linked to poorer mental health.
- * Parents (particularly mothers) of infants and young children experience significant changes to the quality and quantity of their sleep. This can affect parental mental health and contribute to stress or conflict in families
- * Establishing consistent and positive bedtime routines can be helpful in building good sleep habits in children from an early age.

Summary

Sleep and school

Sleep in children and adolescents is closely linked to their mental health and wellbeing. Two-thirds of teenagers (66%) in our survey said that sleeping poorly has a negative effect on their mental health. Difficulty sleeping in late childhood has been found to predict depression in adolescence⁵⁸ and there is some evidence to suggest that a lack of sleep (and to a lesser degree, chronic excess sleep) is linked to suicidal thoughts in young people.⁵⁹ By contrast, children and adolescents who achieve a recommended sleep duration may be better able to manage their emotions and report a better quality of life and wellbeing.^{56,60}

Adolescence may be a time of particular vulnerability to poor sleep and irregular sleep habits⁶¹, as, at puberty, adolescents experience a developmental change in their sleep and wake patterns. Their circadian rhythm delays by one to three hours and so they start to favour later bedtimes, alongside a slowing of the rate at which pressure to sleep accumulates.⁶²⁻⁶⁴ This means that, from puberty, adolescents start to feel less natural pressure to sleep earlier in the night and a desire to go to bed later and wake later. However, the lives and routines of adolescents mean waking up later isn't always possible, leading to many teens experiencing a chronic lack of sleep.^{63,65} In our survey 63% of teenagers felt they slept well at least most nights in a typical week.

School routines and sleep

Schools are one key part of adolescents' routines that can limit their ability to get enough sleep, mainly due to school start times requiring adolescents to wake up earlier than their circadian rhythms would prefer.⁶⁵ Adolescents' extra-curricular activities, part-time employment, coursework or revision, socialising with friends and use of digital devices at night may also contribute to delayed bedtimes.⁶⁶ This means that adolescents can experience social jetlag due to this misalignment between environmental and biological timing and a chronic lack of sleep over weekdays (due to compression of available sleep time on school nights) with a resulting need for longer 'catch-up' sleep on weekends. The increased degree of social jetlag and sleep compression has been linked to poorer academic performance and health outcomes including depression.⁶⁷

Much of the research on the effect of delaying school start times has been conducted in America, where it is estimated that only about 15% of public high schools start at 8:30am or later.⁶⁸ American professional bodies such as the American Academy of Pediatrics, American Academy of Sleep Medicine and The Society of Behavioral Medicine all recommend that schools start at 8:30am at the earliest and set start times which allow students to obtain the developmentally appropriate amount of sleep needed to support their health and wellbeing.^{65,68,69}

In our survey, more than half of teenagers (56%) who are studying or working said that they had to be at school, college, university, or workplace before 9am.

Furthermore,

38%

of teenagers who are studying or working said that they had been too tired to do schoolwork or study, and 43% had been too tired to concentrate in class or when studying.

Studies that have investigated the effect of delaying school start times have found that even relatively short delays are associated with increases in students' weekday sleep duration.⁷⁰⁻⁷² This seems to be due to the school schedule being better aligned to the adolescent biological clock, with students going to bed at generally the same time but being able to wake up later.^{71,72} In addition to effects on sleep, studies have also reported improvements in attendance, reductions in being late, and less likelihood of feeling too tired to complete work or pay attention in class. There is also some evidence of positive effects on student mood.^{71,72} However, there are few studies that look at the longer-term effect of these changes, and the overall increase in sleep length may be minimal.⁷³ Furthermore, some researchers argue that because exposure to morning light is important for regulating adolescents' biological clocks, delays to school start times may mean this anchoring light exposure is missed, potentially exacerbating the natural delay in adolescents' circadian system. More research on the impact of school start times is particularly needed in a UK context, where schools already tend to start later in the morning,^{74,75} though conducting this research in practice may be challenging due to practical considerations such as the time and resource constraints of schools, transportation to and from school, and concerns from teachers and parents.⁷⁶



School-based sleep education

To raise awareness of the importance of sleep and ways to support healthy sleep habits, a range of school-based sleep education programmes have been created. Many involve taught modules that include content such as: what is sleep, why we sleep, recommended amounts of sleep, things that can contribute to sleep disruption and the consequences of poor sleep.⁷⁷ Studies suggest that these programmes are effective in increasing young people's knowledge about sleep and its importance.^{77,78} However, the evidence for their effect on young people's sleep habits and behaviours is more mixed. Some studies find that in the short-term, sleep education can increase total sleep time and student mood,⁷⁹ as well as some smaller and more limited improvements in sleep hygiene and sleep quality.⁷⁸

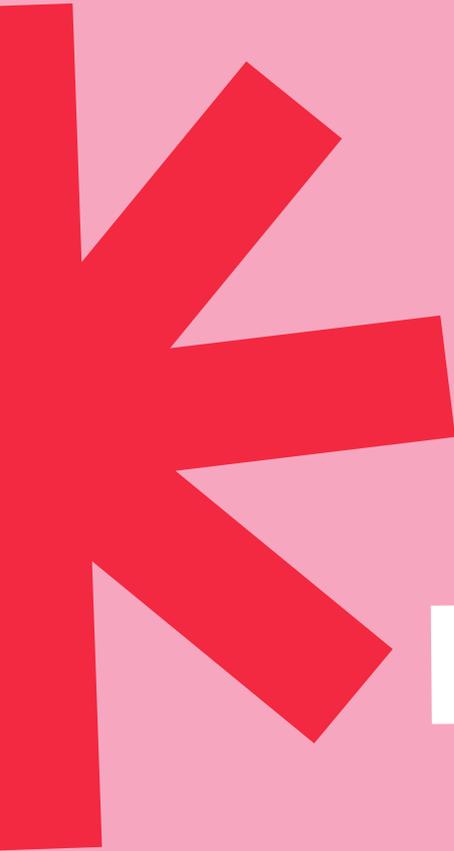


Conversely, other studies have found little overall change in sleep behaviour and sleep duration.⁸⁰ Among the few studies that have looked at such programmes in a university setting, there was insufficient evidence to determine their effectiveness.⁸¹ On the other hand, sleep hygiene, cognitive behavioural and relaxation-based approaches may be effective in improving beliefs about sleep, and to a lesser extent, improving the mental health of university and college students.⁸² Certainly, given the low relative cost of education interventions, more research is needed in this area.

Including parents in school-based programmes may be important for their effectiveness, as parents play a key role in determining children's sleep habits.^{80,83} It may also be beneficial to assess a student body's pre-existing levels of awareness before implementing sleep education so that the content can be tailored to fit the local context and address specific areas of need or gaps in knowledge.⁸⁴

Summary

- * Around puberty, adolescents experience a developmental shift in adolescence toward more 'evening types' - leading to a preference for later bedtimes and wake times.
- * Adolescents' routines, including school and social schedules, may affect the amount of sleep they obtain, which has implications for their mental health. Two-thirds of teenagers (66%) in our survey said that sleeping poorly has a negative effect on their mental health and 63% felt they slept well at least most nights in a typical week.
- * Delaying school start times may increase sleep by better aligning the school rhythm with that of the adolescent biological clock, allowing students to wake up later. More research on this is needed in the UK context.
- * School-based sleep education programmes can be used to increase student knowledge about sleep. Including parents in these programmes and tailoring them to the school's local community context may help increase their effectiveness.



Sleep and work

Our sleep has a significant impact on our working lives, from our performance and energy at work to our interactions with our colleagues. So too, can our work affect our sleep. Things like shift patterns, the encroachment of work into our home lives, workplace stress, and commuting can all interfere with the quantity and quality of our sleep which has clear implications for our mental health and wellbeing.

Workplace characteristics

High work demands (for example, time pressure and workload), the amount of control people feel they have over their job, as well as job strain, bullying at work, and an imbalance between effort and reward are all associated with poorer sleep quality and quantity.⁸⁵⁻⁸⁷ All of these are also known to contribute to poor mental health in the workplace.⁸⁸ Physical work characteristics (such as noise levels and space) can also influence the amount of sleepiness that workers experience,⁸⁶ and short and variable off-duty periods and lengthy commutes frequently degrade quantity and quality of sleep and are associated with fatigue.^{85,89} The effect of these workplace factors may be cumulative. It has been estimated that an employee who works irregular hours, commutes 30-60 minutes to and from work each day and is exposed to psychosocial risks in the workplace (such as unrealistic time pressures) sleeps an average of 28.5 minutes less per day than someone who does not, adding up to a cumulative 173 hours of lost sleep per year.⁸⁵

In our survey,

37%

of working adults reported that their work (for example, workload, problems with colleagues and job security) reduces the amount of control they feel they have over their sleep.

Sleep is a key factor contributing to the productivity and alertness of a workforce. Poor sleep quality is associated with presenteeism (being present at work when not well, fatigued, or not performing at usual levels)⁹⁰ and impairments in alertness and performance.⁹¹ In our survey, 60% of working adults reported that a lack of sleep had made them less able to concentrate at work, and more than one third (35%) reported that it had caused them to make more mistakes. Mistakes by fatigued workers can have far-reaching negative effects, ranging from medical errors to motor vehicle crashes.⁹²⁻⁹⁴ Poor sleep also has implications for how we interact with others in the workplace;⁸⁶ in our survey, more than one in ten (12%) working adults reported that a lack of sleep had caused them to argue with colleagues.



Shift work and sleep

Shift work is a vital component of our modern economy. According to our survey, 11% of working adults work a mixture of shifts, including daytime shifts and nightshifts. Shift work therefore has potential consequences for a great number of people's physical and mental health, social wellbeing, and family life through disruption of biological, sleep, and social rhythms.⁹⁵

Shift workers can experience social jetlag and circadian misalignment due to their schedules. Most people recover from this within a few days once they return to a normal sleep-wake schedule. However, for some people it substantially impairs their ability to sleep, resulting in symptoms of insomnia, severe sleep debt and daytime sleepiness, alongside a more prolonged recovery period once the shift work has ceased. This is a recognised sleep disorder known as shift work disorder (SWD), and it affects around 10-23% of rotating shift and night-shift workers.⁹⁶ In some individuals, SWD can persist even when they have returned to a regular, daytime work pattern. Research suggests that night shifts and early morning shifts may have the greatest effect on sleep.^{92,96} Shift workers are also at greater risk of a range of physical and mental health problems

including depression and anxiety.^{93,97} Those identified as having SWD, or sleep-related impairments associated with shift work, are at an even greater risk.⁹⁸

Some groups may be more susceptible to the potential negative effects of shift work on sleep. For example, one systematic review of healthcare workers found that older age, morning-type circadian preference, circadian inflexibility, family factors such as being married and having children, and caffeine intake were all risk factors, while physical activity was a protective factor for SWD.⁹⁸ However, another systematic review found that in relation to sleep duration and quality, older people experienced fewer sleep problems than young people in the case of morning shifts, but more sleep problems than young people in the case of night shifts.⁹⁹

Supporting sleep at work

Research has identified multiple types of shifts that organisations should avoid in order to support their employees' sleep and wellbeing, including long shifts (and long work hours in general), short breaks between shifts, and backward-rotating shifts (night–afternoon–day). It may also be beneficial for workplaces to avoid consistent early morning or night shifts; however, this is less clear as fixed shifts may at least afford the opportunity for circadian rhythms to adapt. As some evidence suggests the effect of shift times on sleep can vary by individual factors (for example, age and circadian preference), organisations should promote choice of shift for all workers so they can pick a shift pattern that best suits their chronotype, and may particularly wish to consider limiting night shift work for people 45-50 years of age and older.^{91,99}

Employers should also, if possible: introduce changes to the environment to modulate light exposure,⁸⁹ use scheduling and monitoring tools that consider sleep; and offer healthy sleep programmes including CBT-I and meditation techniques which can be delivered face-to-face or digitally. Employees should be encouraged to rest and prioritise sleep before, during and after shifts, including taking a nap before or during shifts.^{86,100,101}

Special consideration should be given to staff working night shifts who also have daytime care or childcare responsibilities, as this may restrict their ability to obtain sufficient sleep during their non- working hours.

Employers also have a role in encouraging healthy behaviours that support good sleep and mental health and wellbeing, such as regular exercise, smoking cessation and proper nutrition (for example by signposting to information or ensuring the organisational culture and structure supports these behaviours); and providing socialisation opportunities and support groups for staff to promote a good work-life balance. In general, psychosocial work variables such as social support at work, feeling as though workers have control over their job, and feeling as though you are treated fairly at work, are related to fewer sleep disturbances and better mental health and so should be promoted by employers.^{88,102} Interventions to improve work-life balance and support employees to 'switch off' when not at work (such as minimising job demands and stress management interventions) may also help to reduce sleep difficulties.⁸⁶





Given the widespread shift toward home-working arising from the COVID-19 crisis, it is interesting to note that in our survey, nearly a quarter of UK workers (23%) said that the option to work flexible hours (such as, to start later or finish earlier) and work from home more often (24%) would help them to get the right amount and quality of sleep. UK workers in our survey also reported that not having to travel so far to and from work (15%) and having breaks at work when they could nap if they wanted (15%) would help them get the right amount and quality of sleep. One in ten (10%) reported that not being contacted by colleagues outside working hours would help.

To develop processes to support good sleep which are tailored to industry and workplace, it is recommended that employers consult experts, regulators, worker representatives and employees.^{103,104} Further guidance for employers on sleep in the workplace is available in a toolkit developed by Public Health England and Business in the Community.¹⁰⁵

Summary

- * The characteristics of a workplace affect our sleep and our mental health. In our survey, 37% of working adults reported that their work (for example workload, problems with colleagues and worries about job security) reduces the amount of control they feel they have over their sleep.
- * Poor sleep is associated with lower productivity and increased presenteeism. In our survey, 60% of workers reported a lack of sleep had made them less able to concentrate at work.
- * Shift workers are at risk of sleep difficulties and mental health problems due to shift schedules conflicting with their body's circadian rhythms.
- * Employers should ensure they support good sleep and good mental health at work by promoting a choice of shift, offering healthy sleep programmes to staff, promoting good work-life balance and consulting experts and worker representatives to develop flexible work schedules.

Sleep and our environment

Our immediate surroundings (our home, school, and work) and the community we live in all have important implications for our sleep quality and our mental health and wellbeing. Noise and light, in particular, are two environmental factors that we know can affect the length and quality of our sleep.

Noise

Noise is considered a significant environmental pollutant.¹⁰⁶ Night-time noise can affect typical sleep patterns by making sleep lighter and less refreshing.¹⁰⁷ Importantly, this effect on sleep may occur without us being aware of the night-time noise. Poor quality sleep and feelings of tiredness directly affect our daytime functioning and can have negative consequences for our mental health.^{106,107} In general, the WHO recommends annual average night-time noise (usually referring to noise between the hours of 23:00 and 7:00) should not exceed 40 decibels (about the noise-level of a quiet, residential street).¹⁰⁸

Studies have found that night-time noise (for example from road, air, or train traffic) can increase the time it takes people to fall asleep and the number of times they wake up during the night and also cause them to wake up too early.^{106,109,1102}

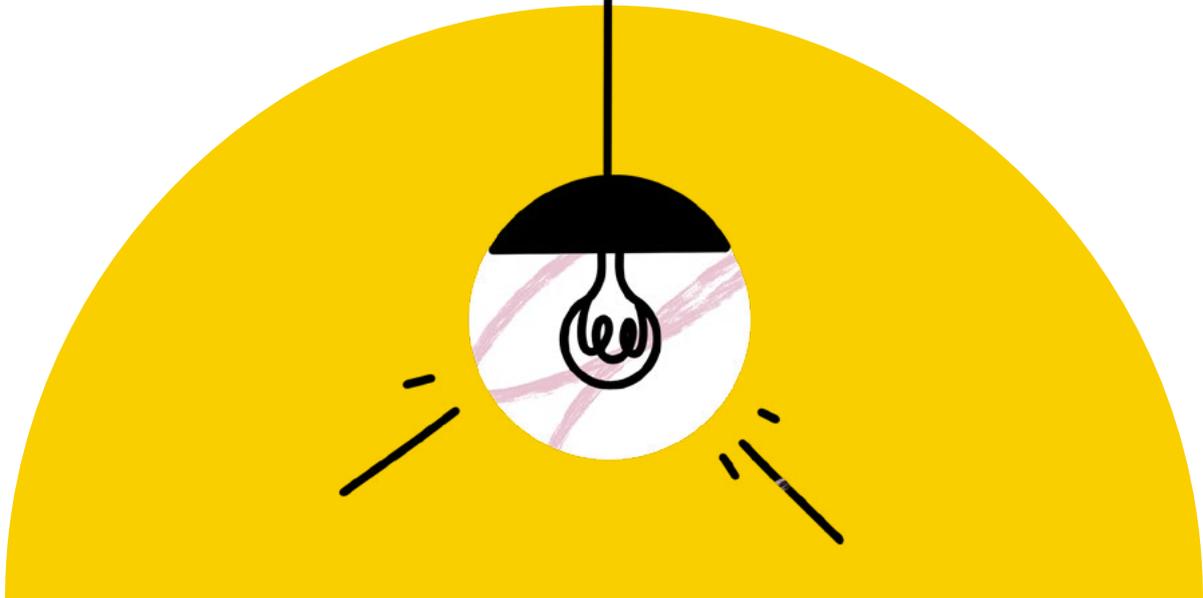
Intermittent noise has been found to have more negative effects on sleep than constant or continual noise.¹⁰⁷

In our survey,



8%

of UK adults reported that noise from cars, lorries, buses and/or motorbikes had negatively affected their sleep in the past month and 14% reported that their neighbours, people they live with, or other people making noise in the street reduces the control they have over their sleep. Aside from the source of noise, the pattern of noise is also important – for instance, intermittent noise has been found to have more negative effects on sleep than constant or continual noise.¹⁰⁷ There is evidence to suggest that noise-related sleep disturbance can negatively affect wellbeing, stress, and mood.¹¹¹ However, the effect of noise on sleep is not likely to be the same for everyone, and our individual levels of sensitivity to noise can differ.¹¹



Light

Light can have a profound effect on sleep, wakefulness, and mood. It is an important cue to our bodies about what time of day it is and so mistimed lighting can negatively affect sleep by disrupting our body's circadian rhythms.^{113,114}

In our survey,

7%

of UK adults said that light outside their home negatively affected their sleep in the previous month.

The effects of light on sleep, however, are dependent on a variety of things, including the amount, brightness, and timing of the light exposure as well as the wavelength of

Exposure to light in the mornings is helpful for synchronising our biological clock.

the light itself.¹¹⁵ For example, our circadian rhythms is more sensitive to blue enriched light (such as the light that is emitted from smartphones and computers)¹¹⁶ and exposure to light in the evenings (both natural light from longer days, and artificial light) has been linked to delayed bedtimes and shorter sleep, whereas exposure to light in the mornings is helpful for synchronising our biological clock.

Sleeping environment and habits

The characteristics of our homes have an important influence on our sleep. This includes noise from those we live with, the characteristics of our sleeping space, and our own sleep habits and behaviours. In our survey, nearly one in ten (9%) UK adults said that noise from the people they live with negatively affected their sleep in the previous month. This was highest for adults between 18 and 24, nearly a quarter of whom (24%) reported this, perhaps reflecting an increased likelihood to live in shared accommodation as compared to other age groups. During coronavirus lockdown restrictions, those living in homes with limited access to natural light, or no access to outdoor space, may be at greater risk of sleep problems due to restricted opportunities to gain exposure to natural daylight, fresh air, and regular exercise, all of which are important for regulating sleep and circadian rhythms.³

Practical considerations, like sharing a bed with a partner who snores or has disrupted sleep, can also influence sleep quality.^{37,117}

In our survey,

16%

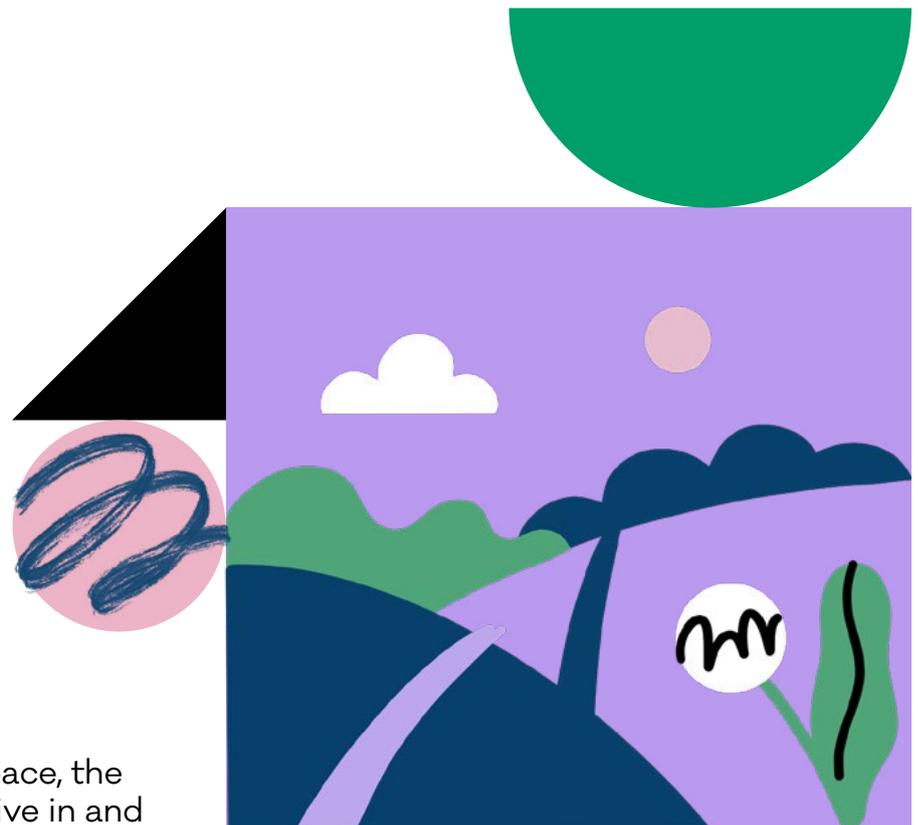
of adults (10% of men and 21% of women) reported that their partner's snoring had negatively affected their sleep in the last month.



There is also some evidence that light from device screens can be a cue to our bodies that it is not yet time for sleep, delaying our circadian rhythm.^{62,119}

In terms of sleep behaviours, the use of screens (such as phones, tablets, computers and television) to play games, watch videos or go on the internet or social media is linked to later bedtimes and shorter sleep lengths.^{53,118,119} In our survey one in ten (10%) UK adults said that watching TV or boxsets/films before they sleep had negatively affected their sleep in the last month, and one in eight (13%) said that using social media before they sleep had negatively affected their sleep in the last month. The link between screen use and worse sleep could be due to several things, the simplest being that time spent on devices at night is time that is not spent sleeping.^{62,119} The content we access on our devices may also cause an emotional reaction (for example, excitement) that makes us feel more mentally alert and less sleepy, and there is also some evidence that light from device screens can be a cue to our bodies that it is not yet time for sleep, delaying our circadian rhythm.^{62,119} In general, we should all try to reduce or avoid the use of screens before bed. For young people in particular, it is recommended that health professionals, teachers and parents work together to minimise device access at bedtime.¹²⁰

In terms of our bedroom sleeping environment, it is recommended that to make it easier to fall and stay asleep, we make sure the room we sleep in is restful, quiet, cool, and dark and used mainly for sleep or sex, and not for things such as work or eating.¹²¹



Sleep and our community

Beyond our immediate living space, the features of the community we live in and the general atmosphere of our local area can also influence our sleep. Environmental factors that promote good sleep include features that encourage physical activity, such as having access to green and blue spaces and living in places with favourable walking environments.^{122,123} Physical activity, which increases deep sleep, is associated with reduced occurrence and severity of sleep problems and is also associated with better mental health.¹²²

People living in areas that have higher levels of noise and light pollution and a higher population density, can experience poorer sleep.¹²² Perceptions about where you live are also important – for instance, feeling safe, socially connected and able to trust your neighbours are all associated with good sleep, and with better mental health.^{122,123}

Sleep and homelessness

Given the stress, uncertainty, and poor living conditions that people experiencing homelessness encounter every day, it is not surprising that many experience problems with sleep.¹²⁴ There are numerous obstacles to achieving good sleep: for those living on the streets, this can include the weather and the lack of safety and security (risk of attack or theft), and for those living in sheltered accommodation, it can include lack of privacy and uncomfortable sleeping conditions.¹²⁵ Studies highlight that experiencing homelessness is linked with sleep problems and inadequate rest, with the quality of sleep potentially playing a more important role in wellbeing than the quantity of sleep.^{124,125}

Summary

- * Environments that are noisy and bright are linked to difficulties sleeping.
- * Our community environment is also related to our sleep. For example, communities in which residents feel unsafe are associated with poorer sleep and poorer mental health.
- * Where possible, bedrooms should be kept cool, quiet, and dark to support good sleep.
- * Everyone should try to avoid screen use at bedtime as this has been linked to poorer sleep quality and quantity.

Sleep and inequalities

Sleep is important for everyone's mental health and the ways that sleep plays a role in our relationships, schools and workplaces, and community and living environment will be relevant for us all. However, there are also some wider inequalities in the quantity and quality of our sleep, which may play a role in the inequalities seen in mental health more broadly.¹²⁶

Sex and gender

In our survey, more than half (52%) of women agreed that sleeping badly has a negative effect on their mental health, compared to 44% of men.

Sex differences have been observed both in the normal sleep patterns of men and women and in the prevalence of some sleep disorders.¹²⁷ For example, the prevalence of insomnia has been found to be higher in women¹²⁸, whereas obstructive sleep apnoea has been found to be more prevalent in men.¹²⁹ The exact cause of these differences is not yet known. While there may be a biological basis for some sex differences, the degree to which sleep varies between men and women may also be influenced by social factors.¹²⁷ For example, experiences such as pregnancy and new motherhood are known to have a profound impact on sleep.⁴⁷ This may be particularly salient in the context of the COVID-19 crisis with one recent study suggesting that women, particularly those with young children, reported higher rates of perceived sleep loss.⁴

The influence of menopause in mid- and later- life has also been highlighted as having an influence on sleep.¹³⁰

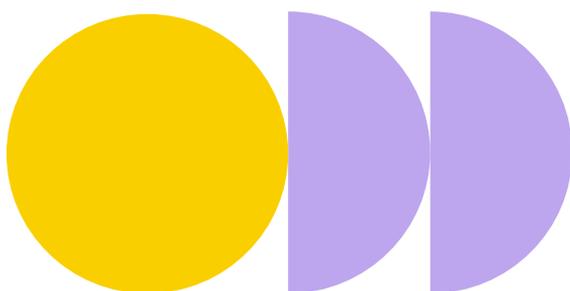
Reports of poor sleep may increase during the transition to menopause^{131–133} and symptoms such as hot flashes may contribute to poorer sleep quality,^{131,134} however it is likely that causes of such sleep disturbances are multi-factorial.¹³²



Race and ethnicity

Research has found that minority ethnic adults (in particular, Black/African American adults) are more likely to experience shorter, and poorer quality, sleep.^{30, 135–137} These inequalities may be present from an early age, with some research finding that white youth generally have more sleep than minority ethnic youth.¹³⁸ Ethnicity may also intersect with factors like gender, with some studies finding, for example, that multiracial women have a higher likelihood of reporting sleep complaints.¹³⁵

This disparity in sleep experience may reflect larger social and economic inequalities. Minority ethnic groups have been found to be more likely to work longer hours, later shifts and multiple jobs, which can negatively affect sleep duration and quality.¹³⁹ For example, recent research on sleep during the COVID-19 crisis



Experiencing discrimination is associated with poorer sleep

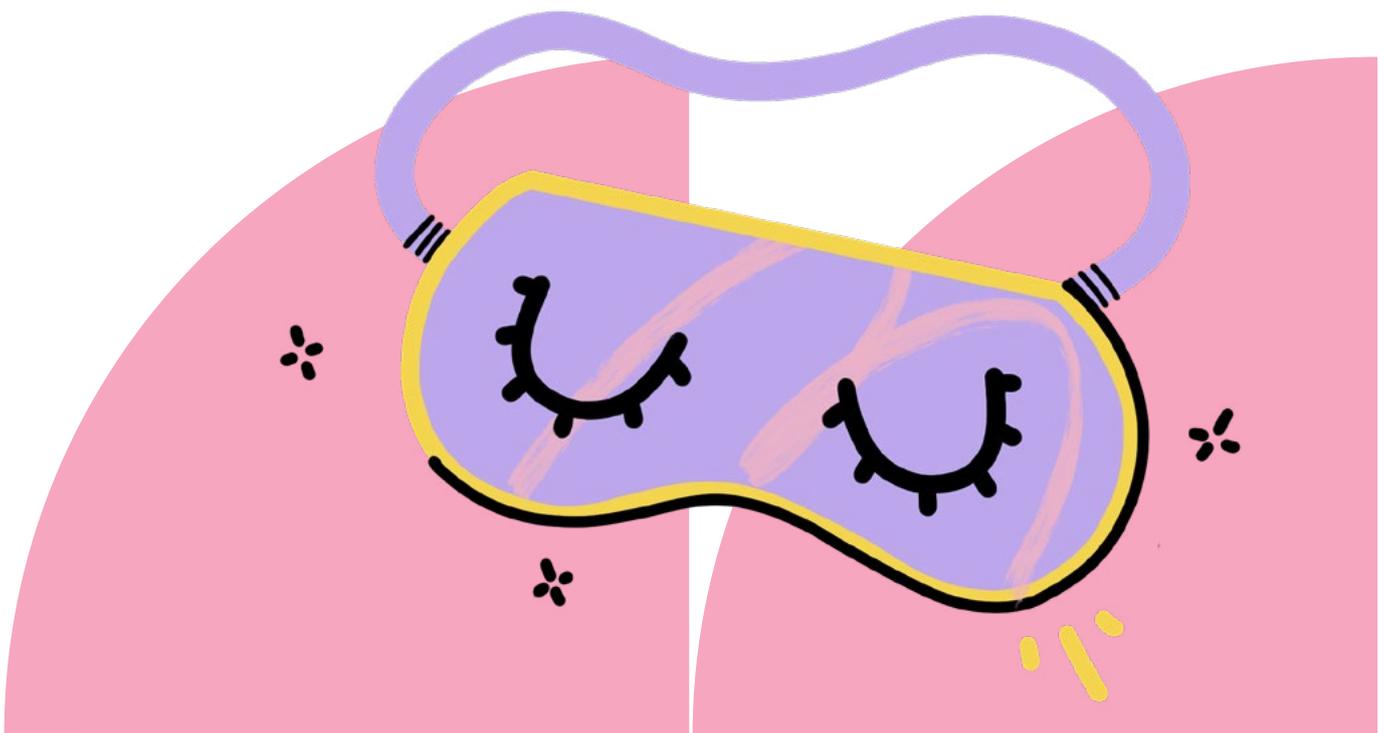
found a higher prevalence of perceived sleep loss among individuals from BAME communities. However, once other socio-economic factors were accounted for (such as the presence of young children in the household, perceived financial difficulties, and being a key worker) this was no longer the case.⁴

Furthermore, experiencing discrimination is associated with poorer sleep.¹⁴⁰ People who are victims of hate crimes, which are often motivated by race, are more likely to experience problems sleeping, and anxiety and panic attacks, compared to victims of other types of crime.^{141,142}

Experiences of trauma

Experiences of trauma and adversity can have a significant impact on sleep quality and quantity. Poor sleep is shown to have a clear relationship with the experience of trauma. For example, research has found that sleep disturbances are common among people exposed to traumatic experiences such as abuse, bullying, violence in the home and bereavement.^{143–146} In our survey, 15% of UK adults reported that thoughts and feelings about a traumatic experience had negatively affected their sleep in the previous month.

The relationship between sleep, trauma and memory processing is complex, and sleep is a central component of post-traumatic stress disorder (PTSD). Sleep and trauma are often discussed in relation to PTSD. Disrupted sleep, including the experience of nightmares as a way of re-experiencing a traumatic event, is one of the symptoms of PTSD, and those with pre-existing sleep difficulties may be at a higher risk of developing PTSD after exposure to a traumatic event.¹⁴⁷



Income and disadvantage

Socioeconomic status (a combination of education, occupation, and income) has a significant relationship with how well we sleep. For instance, children from families with lower socioeconomic status often have poorer sleep¹⁴⁴ and socio-economic disadvantage increases the likelihood of experiencing poorer sleep quantity and quality.¹³⁵ Poverty and financial concerns in particular have been associated with poor sleep. For example, individuals who live below the poverty line have been found to have particularly poor sleep quality,^{135,137} and food insecurity (having insufficient resources for consistent access to food) has been linked to a higher risk of sleep disorders, depression and anxiety.¹⁴⁸ Our survey supports this, with a quarter (25%) of UK adults reporting that worrying about money matters, including bills, negatively affected their sleep in the past month, as did worrying about debts (14%) and worrying about paying a mortgage/keeping a roof over their heads (11%). Moreover, our survey highlights that unemployed individuals comprised the highest proportion of adults who reported experiencing suicidal thoughts and feelings (27%) or intentionally hurting themselves or self-harming (18%) due to a lack of sleep.

This association between sleep and socioeconomic inequalities highlights the importance of recognising sleep as a factor that is not only related to individual characteristics but also something that needs to be recognised and addressed at a societal level. Added to this, the services available to people for their sleep have been described as a 'postcode lottery', which could further perpetuate socioeconomic disadvantages.¹⁴⁹ Further research and more comprehensive support is needed to address the relationship between sleep outcomes, mental health, and social determinants such as employment and income.





Summary

- * It is important to recognise sleep as something that should be addressed not only on an individual level, but also on a societal level.
- * Black, Asian and minority ethnic adults are disproportionately likely to experience poor quality and quantity of sleep, which may be linked to experiences of discrimination and wider social and economic inequalities.
- * Experiences of poverty and financial insecurity are linked to poorer sleep and poorer mental health.
- * In our survey, a quarter (25%) of UK adults reported that worrying about money matters, including bills, negatively affected their sleep in the past month. Of those who were unemployed, more than a quarter (27%) reported experiencing suicidal thoughts and feelings due to a lack of sleep.

Implications and recommendations for policy

Sleep is as important to our health as good diet and exercise. Yet for many of us, when we are faced with competing priorities, sleep is the first thing to suffer. For some of us, simply reprioritising sleep and using well-known 'sleep hygiene' tips may be enough. However, for many, sleep quantity and quality will be determined by factors that are out of our control.

Factors preventing good sleep include environmental factors (such as neighbourhood noise or a new baby at home) or a long-term condition, pain, stress or anxiety.

We want the governments across the UK to prioritise sleep – this means incorporating sleep, as a priority area in mental health and wellbeing strategies, promoting good sleep through public education, investing in further research into sleep and supporting health professionals to better understand, support and treat sleep problems.

The current Public Health England evidence review of sleep and health, due to report in 2021, should consider this report and its recommendations.

Our two overarching policy recommendations are:

Governments across the UK must incorporate sleep (including the prevention and treatment of sleep problems) into their mental health and wellbeing strategies – sleep is fundamental to good mental and physical health.

UK Research Councils must work with UK partners to fund research to better understand the role of sleep as a central determinant of health and wellbeing, and of directly addressing poor sleep as a central component of mental health.

Healthcare

There is a strong bidirectional relationship between sleep and health and sleep should be considered essential in the management of all health conditions, including long-term conditions, chronic pain management and mental health problems. Fifty-one per cent of the adults we surveyed agreed that how they sleep affects their physical health, and 22% reported that physical health problems reduce the amount of control they feel they have over their sleep. In hospitals people do not have control over their sleep environment (for example, the amount of light and noise and the bedding that is used) yet promoting good sleep whilst people are unwell is central to their recovery.

Recommendation:

There should be core curriculum training for all healthcare professionals working in both physical and mental health care on assessment and management of sleep disorders.

Appraisals of sleep should become part of routine health assessment at all ages and stages of life. Healthcare professionals should screen for, and support the treatment of, sleep problems in the management of all long-term conditions, chronic pain management, trauma, and mental health problems. Hospitals should undertake reviews and implement environmental conditions that promote sleep as part of recovery.



Workplace

In our survey, 37% of working adults reported that work – including workload, problems with colleagues, and job security – reduces the amount of control they have over their sleep. Sixty percent of UK workers reported that a lack of sleep had made them less able to concentrate at work and 35% reported that it had caused them to make more mistakes. Employers can help employees by supporting their wellbeing, and this should include their sleep. Employers must carry out risk assessments of the work environment and should take into account ‘psychological hazards’ in the same way that they take account of physical hazards. This means looking at hazards that could cause stress and anxiety or harm the mental wellbeing of employees in some way; they should then put in place measures to counter the hazards identified.

For those working nightshifts, our poll found that 57% of these workers surveyed say their mental health is affected by

poor sleep at least once a week. It is already mandatory to be offered health assessments to people working nightshifts, and screening for sleep and mental health problems should be a compulsory part of these assessments.

Recommendation:

Employers must take into account conditions in the workplace that undermine sleep health in the same way as they take into account physical and other psychological hazards. For those working nightshifts, mandatory health assessments should include screening for sleep problems. Where possible, flexible and home working should be offered to employees.



Neighbourhood

Our local neighbourhood, in particular the degree to which we are exposed to the night-time economy, noise and light pollutants, can have a profound effect on how well we sleep. It is important that town and city planners take this into account when embarking on new projects and prioritising regeneration.

Local planners should look to the example of Glasgow's GoWell research and learning programme, which investigates the effects of investment in housing and neighbourhood regeneration in Glasgow on the health and wellbeing of individuals, families and communities.

Recommendation:

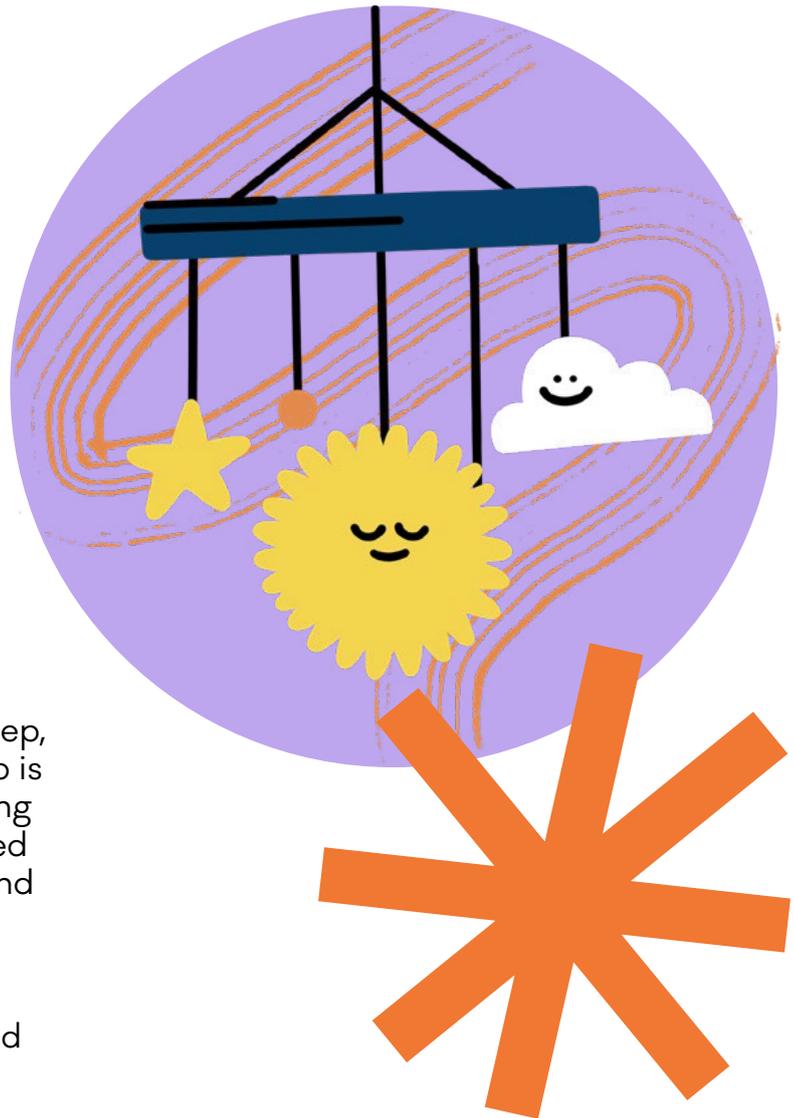
Planners should prioritise elements of planning that have clear implications for sleep, such as: separation between loud roads and railways and residences; limiting street lighting visible from bedroom windows; building in acoustic dampening between noise sources and homes; and ensuring that buildings provide suitably temperature controlled bedrooms. In addition, planners should seek to boost residents' general wellbeing, for example through the provision of green and blue spaces.



Night-time screen use

Recommendation:

Mobile phone companies should give more consideration to how they can support users to have enough sleep. For example, they should include the option for a pop-up message after midnight (or an earlier time of one's choosing) prompting the user to minimise night-time and bed-time smartphone use.



Women, relationships and families

Evidence from our poll and from existing research shows that parental sleep is greatly affected by children's sleep, particularly in the early years when sleep is disrupted by night-time feeding for young babies and bedtime difficulties associated with night-time waking due to baby and toddler developmental stages, teething or separation anxiety. It is important to take a 'whole family approach' to sleep that addresses sleep for both parents and children. This could include establishing bedtime routines for children and/or parents, making changes to the physical environment and/or using interventions for parents (for example, cognitive behavioural therapy or relaxation) if required.

For couples without children, some researchers advocate including partners when planning the goals and approach toward treatment of sleep problems such as insomnia.

Recommendation:

The health service and early years workforce should take a 'whole family' approach to sleep, considering evidence-based sleep interventions and/or support for parents and couples as well as for young children.

Teenagers' sleep and the role of schools

Sleep is one of the strongest predictors of wellbeing among teenagers. We know that teachers are increasingly raising concerns about sleep-deprived pupils in their classrooms, which not only impacts their mental and physical health but also on their concentration, and learning. Schools and local authorities should consider the potential benefits of later school start times for older teenagers, and/or restructuring the school timetable to both avoid scheduling cognitively demanding classes in the first two hours of the day and enhance classes which may regulate the circadian clock, for example outdoor or active classes. Physical education, music and the arts, personal development or wellbeing classes that include mindfulness, could be scheduled in those periods instead. Consideration also needs to be given to exam scheduling, delaying exam start times to a time better aligned with the adolescent circadian clock.

A 'whole-school approach' to mental health encourages staff and pupils alike to speak openly about their emotional wellbeing and to ask for help. These conversations should include sleep and sleep deprivation as a root cause of mental distress, reduced empathy, greater impulsivity and more negative thinking. Breaking the self-stigma on sleep is vital to ensure that both pupils and staff are supported at the right time.

Schools should develop empathetic responses to sleep-deprived pupils. Teachers, school nurses, counsellors and leadership staff should be encouraged to ask about sleep when pupils are experiencing distress.

Schools should ensure that wellbeing or personal and social education classes include practical sleep toolkits to help young people schedule and prioritise sleep. These could be co-produced with pupils themselves. Research shows that the most effective sleep education programmes seek to alter sleep practices rather than passively furnish information. Classes could be asked to record sleep diaries and think about the timing, quality and quantity of their sleep. Pupils could be shown how to make changes to their routines in practical ways, with information on caffeine intake, exercise times, how to 'switch-off' before bed and social media use last thing at night and first thing in the morning. The toolkit should also include guidance for parents – information about the teenage body-clock and how parents can help their children improve their sleep.

Finally, schools should develop empathetic responses to sleep-deprived pupils. Teachers, school nurses, counsellors and leadership staff should be encouraged to ask about sleep when pupils are experiencing distress. A set number of sleep wellbeing days could be granted, allowing pupils to self-excuse due to poor sleep the night before, or a period of chronic sleep deprivation. Alternatively, pupils could be supported to work at home when experiencing sleep deprivation.

Recommendation:

Schools should embed the importance of sleep in their whole-school approaches to mental health. This should include reviewing and sleep-proofing their timetables and the timing of the school day, and of the examination schedule, and co-producing sleep toolkits.



How to sort out your sleep

Professor Colin Espie

Five principles of good sleep health

Who is this advice for?

My experience in sleep medicine and sleep science during the past 40 years tells me that there are three groups of sleepless people.

The **first group** is those who would really love to sleep more, and who give themselves the opportunity to do so, but still they can't sleep.

They feel they have tried everything and are at their wits' end with it. The problem for folks in this group is that they tend to have a long-standing sleep disorder, likely one that has been going on for years and years, that prevents them from getting enough sleep or from getting enough good quality sleep. More than that, chronic difficulty sleeping results in daytime consequences that are hard to live with, like sleepiness and low mood. The advice which follows, though you may find it interesting, is not primarily intended for you. If you are in this group then you need proper evaluation of your sleep difficulty, followed by effective treatment. In saying this, I understand that it may be challenging to get the right kind of help, so I empathise with you there.

The **second group** is where most of us have been at some point in our lives. That is, living with sleepless nights from time

to time, or having problems sleeping right now, perhaps because of a period of stress or a life change. In such circumstances we become very aware that we need our sleep to help us cope. It's like a vicious cycle. This kind of sleeplessness has likely been part of your life for weeks or a few months rather than for years, and we want to prevent it from developing into a chronic pattern. On the other hand, we may be crossing our fingers that the difficulty getting to sleep or staying asleep will go away by itself, when things blow over. That will probably be true, but it's still hard to live with. If you are in this group, I hope you will find some useful suggestions here.

The **third group** of sleepless people are folks who don't get enough sleep either because they don't feel they have sufficient opportunity to sleep, or because they don't prioritise sleep highly enough when they do have the opportunity. If you are in this group, we might say that you have a 'poor relationship' with your sleep. If you are someone who is too busy to get enough sleep, or whose work patterns, lifestyle or personal habits get in the way of good sleep or of enough good sleep, then I think this advice is also for you. I'm only too aware that for many people it can feel as though it is circumstances beyond your control, rather than personal choices, that prevent you from getting the sleep you need.

I'm not going to pretend it's always easy to sort out your sleep, but I guess if you thought it was you might not need to hear what I've got to say!

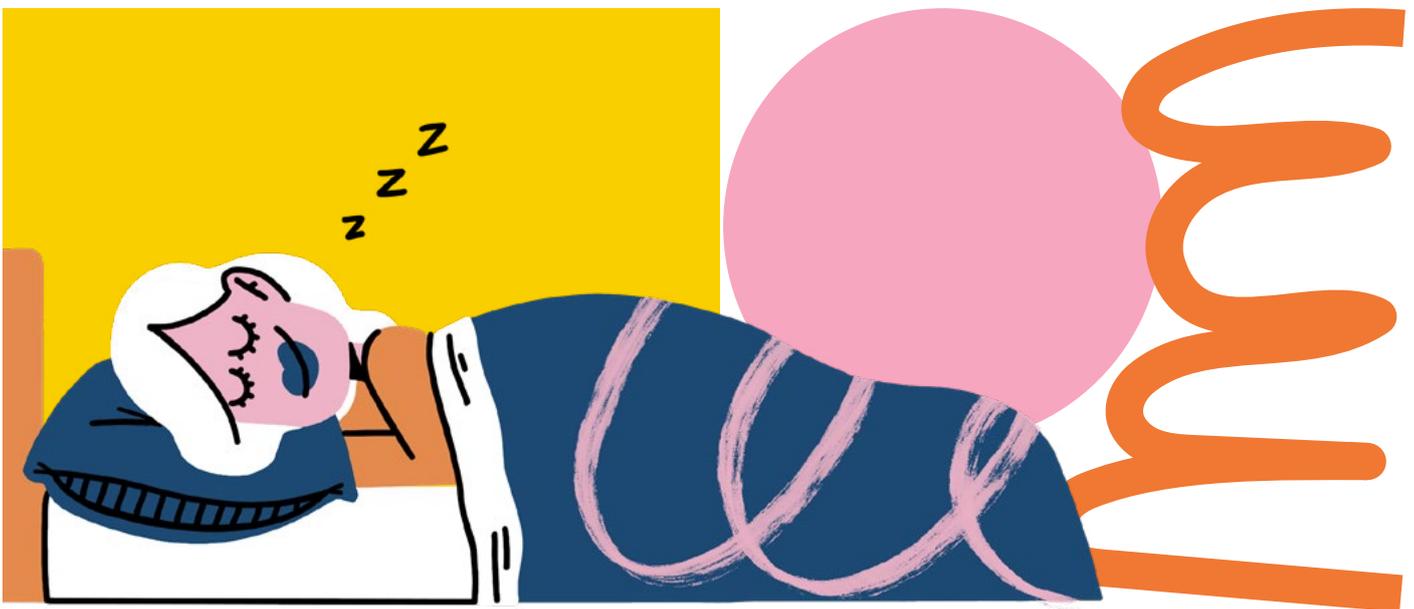
Establishing healthy sleep

What do you expect to read when you come across an article claiming to help you sleep better? Most likely a set of 'sleep tips', some do's and some don'ts. I am certainly going to cover the usual suspects - things like caffeine, comfortable mattresses, ideal bedroom temperatures, use of devices and the like. However, these things, which have become known as 'sleep hygiene', are a bit superficial. After all, sleep is fundamental to every living organism. Cats and dogs, birds and butterflies don't sleep well because they leave their smartphones in the living room, or because they cut down on their Americano intake! It's quite likely that doing those things will not be enough for you either. So, let's get the principles and practices of a healthy sleep lifestyle right, and let's base those upon the best knowledge and the best science. I want to help you to sort out your sleep and to benefit from this precious part of nature's provision.



First principle:

Value your sleep

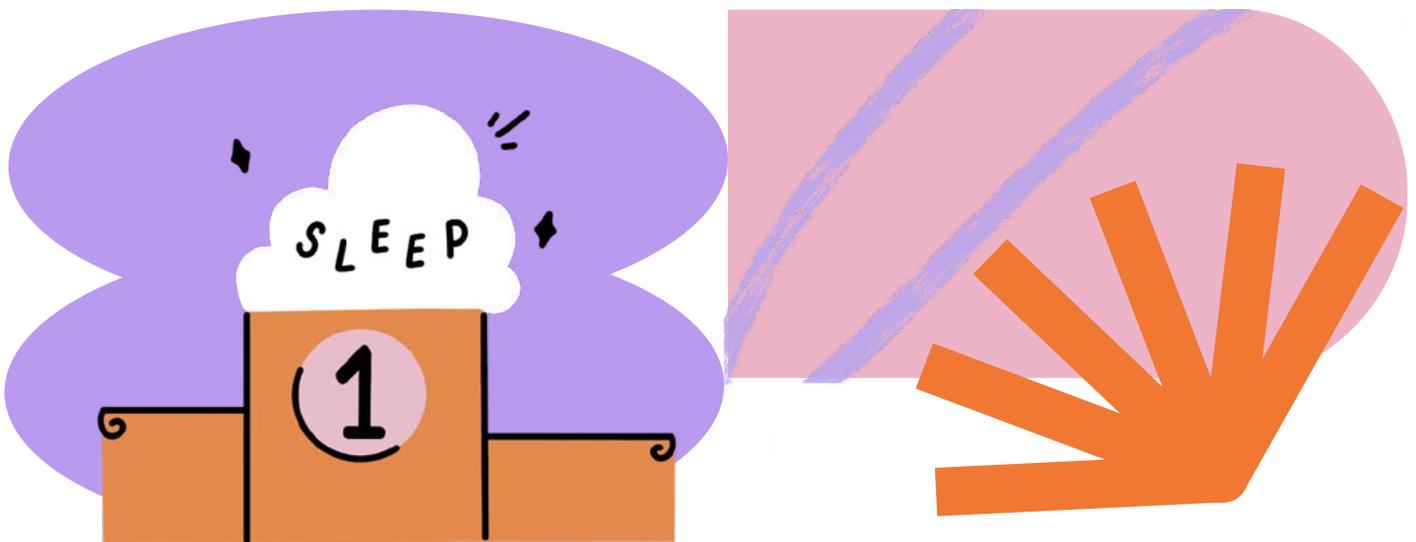


There are only four things that are essential for life. We need oxygen so we can breathe, we need water so we are hydrated, we need food so we are nourished, and we need sleep so we can function. Sleep plays an essential role in the renewal and repair of body tissue, in metabolism, growth and development, infection control, learning and memory, and in the regulation of our emotions. Perhaps you didn't realise that sleep is so crucial? The quality of our daytime alertness, energy, productivity and mood is greatly dependent upon sleep. Think of how you would be the next day if you hadn't slept. If clean drinking water and sufficient food are important, so is having enough good quality sleep. Don't cut corners where sleep is concerned. It can be damaging

to health in the long-term, and that shouldn't come as any surprise. The same would be true if we were malnourished. But sleeping is also a bit more like breathing. It's not something you can choose to do. You can't hold your breath – well not for very long! Likewise, you can't switch sleep on; you have to set the scene with the right attitudes and behaviours and then it will happen naturally. Sleep is so important that it will happen automatically. It's a biological thing. This is why it is also impossible to stay awake. Indeed, one of the dangers of not getting enough sleep on a regular basis is that you will fall asleep without intending to. Therefore, the first principle of establishing healthy sleep is that you need to take sleep seriously.

Second principle:

Prioritise your sleep



This follows from a mind-set that takes sleep seriously. You should prioritise getting your sleep. In other words, not just warm thoughts and good intentions, but action. Prioritising means that you will more often put sleep first, or at least higher up the list, when it comes to making choices about what you want to do. At times this will mean letting go of things that you might actually prefer to do. This can be difficult. Who likes to be the first to leave the party, especially if it just seems to be getting going?! It's possible that you will feel a bit guilty or that you are letting other people down. Social pressures, real or imagined, come into play. Yet, on the other hand, we have become used to managing these pressures, for example by expressing our personal dietary preferences. Remember that the purpose of sleep is to deliver

health, wellbeing and the ability to function during the day. A well-slept, well-rested you is going to be better for everyone. It can be difficult to prioritise your sleep of course when you don't have control of the situation. You could be working shifts, and your night-time might inevitably have to be given over to work. You might have a new baby at home; and so you're saying "I wish!" to the idea of prioritising your sleep. On the other hand, if it's hard for you to choose how and when to sleep, I suspect you will even more wholeheartedly agree with the need to prioritise sleep when you get the opportunities to do so. So, the second principle is about making commitments and setting behavioural goals to create the necessary space for sleep in your everyday life.

Third principle:

Personalise your sleep

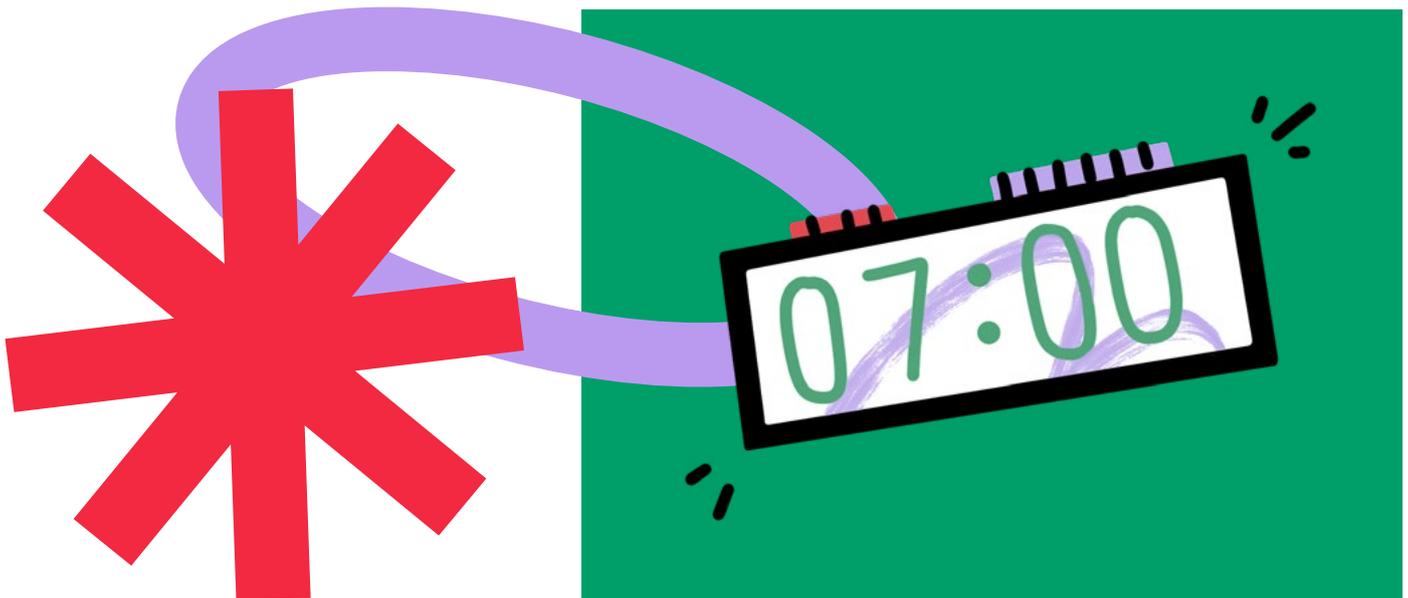


If you are following this then hopefully you are now considering taking sleep more seriously and are thinking of actions that you can take to prioritise getting your sleep... but how much?... and how much is enough?... and is the quality of sleep not every bit as important as its quantity? The third principle is about understanding your personal sleep requirement, and then satisfying those personal needs. We are not all the same. It never ceases to amaze me that we seem to think everyone should follow exactly the same sleep rules. Our other physical characteristics, appetites and preferences differ. How much sleep do you, personally, need? How do you figure it out? That's simple – you do it by trial and error. How do you know your shoe size? Did someone tell you what it ought to be? Personalising your sleep is about experimenting to find the best fit. How long do you need to be in bed to

get enough sleep? If you are willing to experiment to discover your best 'sleep window' I fully expect you will figure it out. Part of this personalising is also about your 'chronotype'. That is, when is the best time for you to go to bed and to get up? People who are natural night owls will tend to feel sleepy later in the evening and to feel sleepy for longer in the morning. Morning larks are the opposite, feeling sleepy earlier in the evening and waking bright and breezy first thing in the morning ... or even before first thing! Accept who you are. Personalise your sleep by getting the sleep that you require, and when you require it. If you do this, you will begin to find that the amount of sleep you need, and your experience of sleep quality, will begin to match up. So, the third principle is to understand your personal sleep needs and to act on this knowledge.

Fourth principle:

Trust your sleep



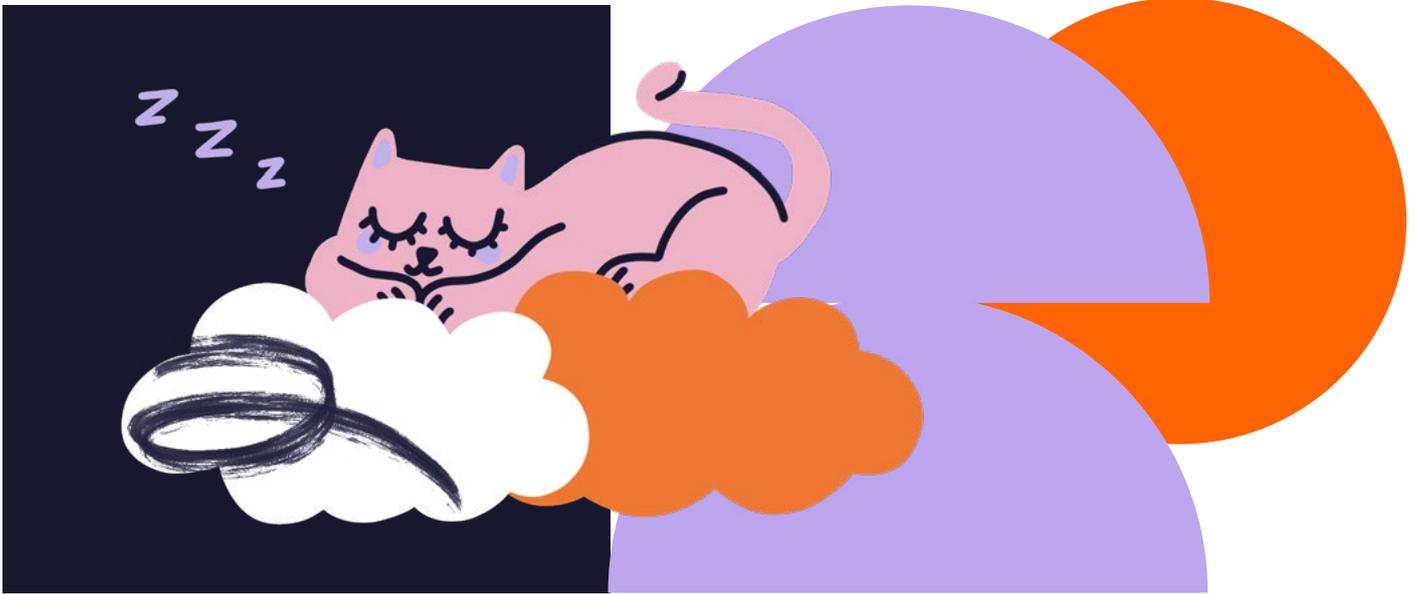
If you have experimented a bit and given sleep the right-sized space or sleep window at the right time for you, the main thing to do next is to trust your sleep to get itself into a good pattern. Remember two things. First, sleep is a natural process that the whole animal kingdom can rely upon. So, you want to let your own sleep needs and your sleep pattern drive you, rather than you trying to drive them. Good sleepers are actually not “good at sleeping”. They are usually not doing anything at all except trusting and expecting sleep to come. In fact, to be honest, they seldom think about it. Nobody is hiding a secret from you about how to get to sleep!

Try to resist the temptation to grab at solutions, trying this and trying that as if you are walking some kind of tightrope. This just heightens anxiety, leads to preoccupation with sleep, and will make

you feel precarious and desperate. If you can't sleep then accept it, and just get up for a while, and go back to bed when you feel sleepy again. Secondly, remember that you can still experiment until you get the shape and timing of your sleep right. It will be trial and error, as I said before, but it will be informed by what you have already tried. Be prepared to try going to bed for shorter periods of time too, so that you are properly sleepy when you settle down; and get up at the same time each morning. All this strengthens the sleep-wake rhythm and helps to establish a pattern you can trust. Keep a note of your experiments if you like. I would rely on data, on evidence from what works and what doesn't. So, the fourth principle is to trust that you will find the right pattern for your sleep.

Fifth principle:

Protect your sleep



Finally, let's think about how you can protect your sleep, by avoiding or preventing things that can cause some upset to sleep. These things may seldom be the cause of poor sleep, but nonetheless you should think them through and address factors that might be relevant to you. Protecting your sleep falls into three categories.

First, there are lifestyle factors. The stimulant properties of caffeine and nicotine tend to delay the start of sleep, so caffeinated drinks are best avoided in the evening; and bear in mind that most e-cigarettes still contain nicotine! Alcohol also disrupts sleep, particularly during the second half of the night; and heavy meals too close to bedtime can lead to restless sleep. Exercise is a good thing, but it's best to have a wind-down time before you retire, so I suggest exercising early- to mid-evening rather than immediately before going to bed. Winding down your activities and responsibilities is definitely a good idea!

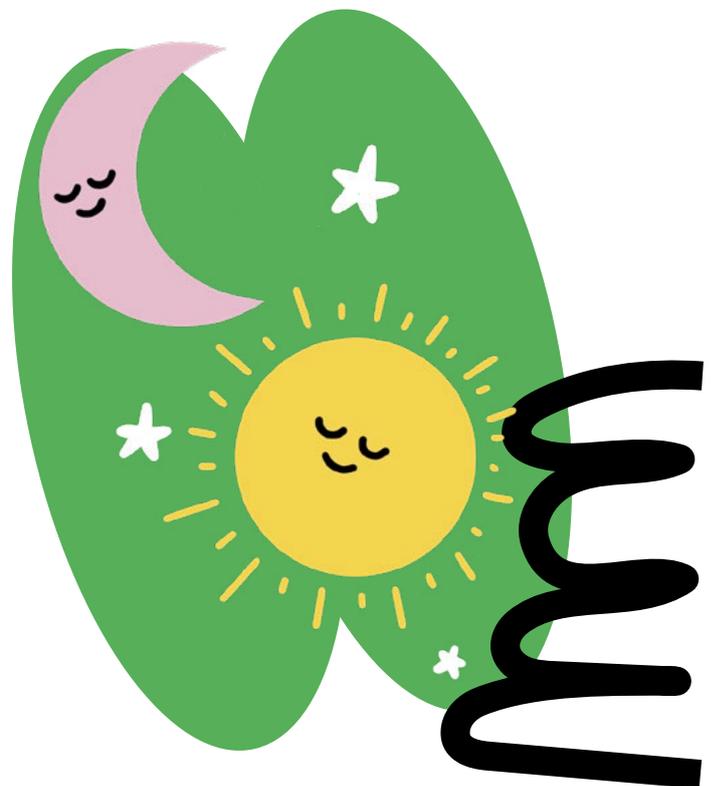
Secondly, there are environmental factors. Again, experimenting is a way to discover

the bedroom environment that suits you. Sleep generally likes cooler and darker, but you can try things out - not too hot or too cold, not too bright or too dark. Also, not too noisy or too quiet. Try to keep the bedroom well ventilated though, and make sure your bed is comfortable.

Thirdly, I want to say a few words about devices and gadgets that monitor sleep, as well as those that can end up keeping you awake for longer. These are a mixed blessing, I think. It's good to take an interest in your sleep, but not good to overanalyse it! Also, most devices that claim to measure sleep don't publish scientific evidence, particularly on people who sleep poorly. So, I would be wary of the accuracy of the information you get from them. Finally, the problem that I see with tablets and smartphones is not so much that they are sources of light in the bedroom, but that they are triggers to remaining awake and alert. Try to keep your bedroom as your place for sleep, not for keeping up with your social media and the latest news alerts. So, the fifth principle is to take action to protect your sleep.

Summary

I would urge you all to value, prioritise, personalise, trust and protect your sleep. Following these five principles of sleep health will enable you to be your best 'you'. None of us can do without sleep; and why would we want to? Certainly, there are pressures on our lives that can make sleep hard to come by, but we need to figure this one out. It's important that we do, because sleep is nature's great healer and provider, not just for us but for all living things. You may feel you are sleeping okay but could sleep better or sleep more; or you may have recently been having sleep troubles that need attention. I hope my advice can get you on the right track. If you have a long-standing sleep problem that requires professional attention, the advice I have given here may not be enough. Just be wary, because there is a lot of complete nonsense out there promoting treatments that don't work. You always get this where there is a gap in provision. Don't be taken in, and don't hesitate to track down help from your trusted medical or clinical advisers.



Summary

To support our own good sleep, we should aim to:

Value

Value our sleep as something crucial to our lives and take our sleep seriously.

Prioritise

Prioritise our sleep by putting sleep first when making choices about what we want to do.

Protect

Protect our sleep by avoiding or preventing things that can upset it.

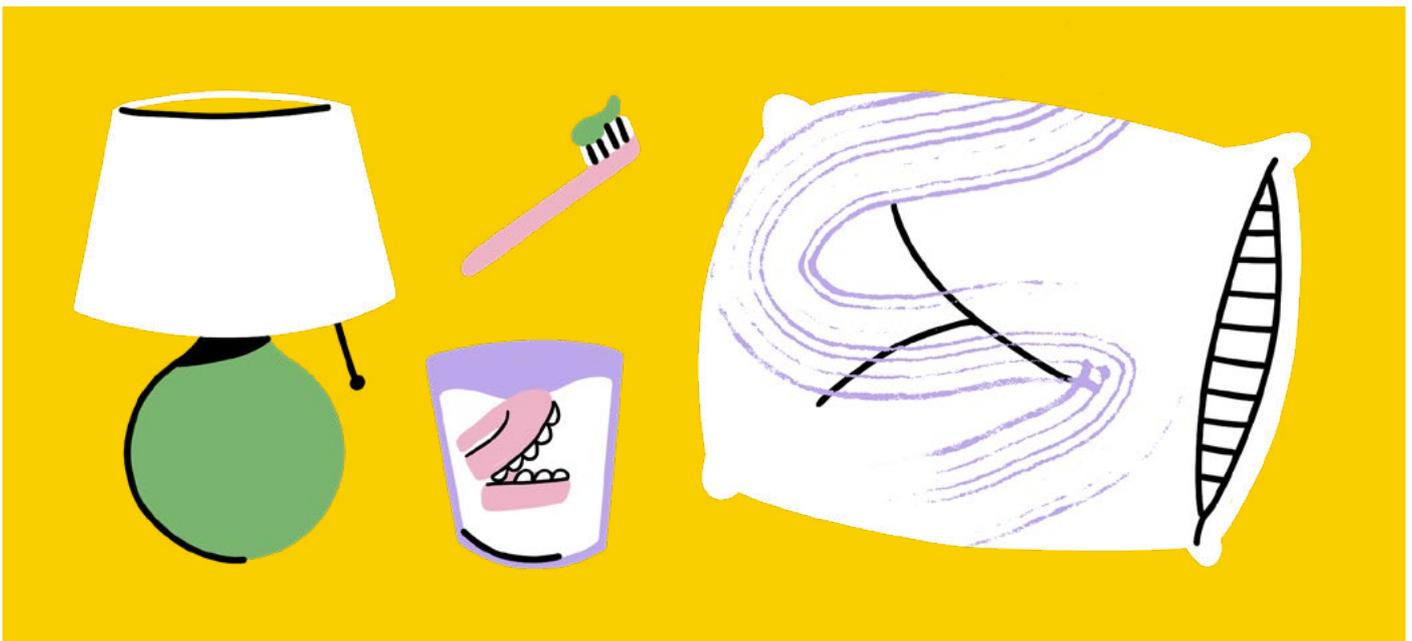
Personalise

Personalise our sleep by finding the 'sleep window' that works best for us.

Trust

Trust that sleep is a natural process and that our sleep will get itself into a good pattern.

For those with long-standing sleep problems, or a sleep disorder that requires professional attention, this advice may not be enough. Don't hesitate to seek further help and support from medical or clinical advisers if you feel you need it.



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Victoria Zamperoni, Jade Yap, Chiara Lombardo, Lauren Weeks, Adam Nice, Emily Wooster, Toni Giugliano, David Crepaz-Keay, Chris O'Sullivan, Catherine Seymour, Lucy Thorpe, Antonis Kousoulis, Mark Rowland.

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^a Total sample size was 4,246 adults. Fieldwork was undertaken between 24th-16th April 2020. The survey was carried out online. The figures have been weighted and are representative of all UK adults (aged 18+).

^b All figures, unless otherwise stated, are from YouGov Plc. Total sample size was 4,437 adults. Fieldwork was undertaken between 9th – 11th March 2020. The survey was carried out online. The figures have been weighted and are representative of all UK adults (aged 18+).

^c All figures, unless otherwise stated are from YouGov Plc. Total sample size was 2,412 teenagers (aged 13-19 years). Fieldwork was undertaken between 11th-30th March 2020. The survey was carried out online. The figures have been weighted and are representative of all GB teenagers (aged 13-19 years).

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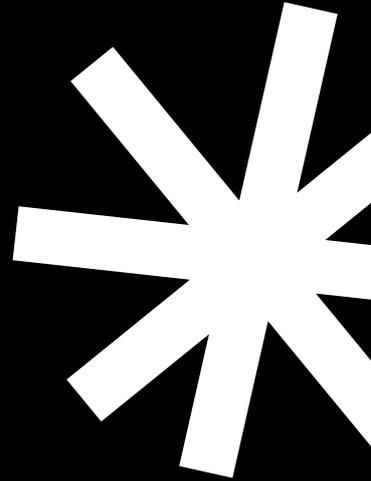
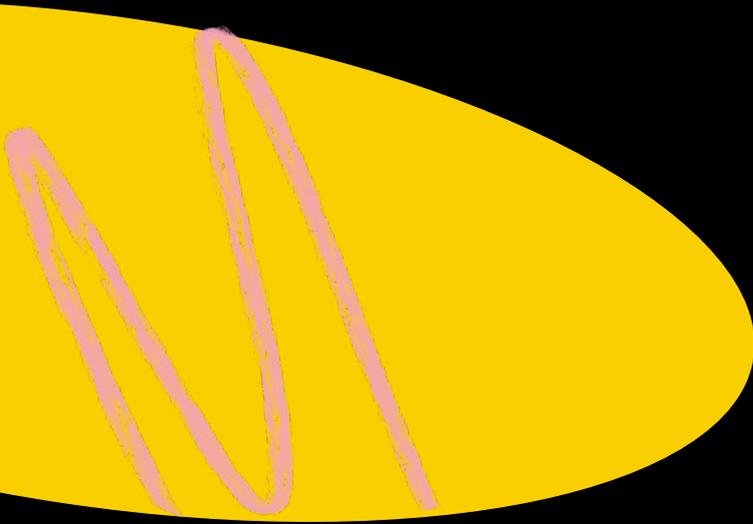
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