Fitbit Enterprise

At the Corner of Sleep & Stress

How understanding the sleep-stress connection can improve population health

The sleep-stress connection

Sleep and stress have a complex, interrelated relationship that affects our overall physical and mental health. Increased stress can be associated with insomnia and conversely, insufficient sleep can contribute to stress. There is growing evidence that suggests insufficient sleep[1] and perceived stress[2] are also associated with changes in metabolism and weight gain.

Together, sleep and stress form the underpinnings of important health outcomes and general wellbeing. When we get enough sleep, we tend to be able to manage our stress better. When we manage our stress, we typically sleep better.

Lifestyle changes—such as increased physical activity—can influence both sleep and stress. Today, understanding the impact of sleep and stress, and changing the behaviors that influence them, is made easier thanks to wearable technology. By giving people a way to understand their own unique health patterns and providing actionable guidance to improve them, users get the tools to drive healthy behavior change.

At the corner sleep and stress, we'll explore:

—The latest findings on sleep and stress in the US

—The interconnected relationship between sleep and stress

—7 ways wearable tech shines a light on sleep and stress patterns

—How to empower holistic behavior changes in your population

The combined sleep-stress crisis

From physical and mental health indicators to workplace productivity, the impact of chronic stress and sleep deprivation is both far-reaching and growing.

Insufficient sleep takes a toll on a population's physical and mental health. The American Academy of Sleep Medicine notes that over time, chronic sleep loss increases the risk of mental health conditions, like anxiety and depression.[3] And lack of sleep is associated with higher dementia risk, compromised immunity, cardiovascular disease, diabetes, and hypertension.[4]

Individuals with chronic conditions are especially affected by insufficient sleep. Compared with those who slept seven hours, those with Type 2 Diabetes who slept five hours or less were at a 33 percent increased risk of death and those with 10 hours or more had an almost doubled (90%) increased risk of death.[5]

STRESS AND BURNOUT ARE ON THE RISE, BUT HELP IS HERE

The impact of stress on mental and physical health is a growing concern, in part because the events of the last three years have added fuel to an already stressed population. Nearly half the population reports physical fatigue as a result of their stress—a 38 percent increase since 2019.[6]

Healthcare professionals are witnessing this first-hand. Providers report that 60-80 percent of primary care visits have a stress-related component.[7]

Meanwhile, nearly three in five employees report negative impacts of work-related stress, including lack of interest, motivation, or energy (26%).[8] Burnout is especially prevalent among healthcare providers, in which 1 in 3 report chronic work-related stress.[9]

And long-term stress is cause for concern. Over a nine-year period, people who reported a lot of stress and that stress impacted their health a lot had a 43 percent increased risk of premature death.[10]

According to RAND, employers are also feeling the impacts of a tired workforce to the tune of billions in economic losses. And when people are tired and stressed, workplace productivity suffers.

In the next section, we'll take a deeper look at the sleep-stress connection, and explore why knowledge is power when it comes to behavior change.

The US sustains by far the highest economic losses due to poor sleep—up to $411 billion per year.[11]

On an annual basis, the US loses an equivalent of about 1.23 million working days due to insufficient sleep.

Workers who are sleep-deprived are more likely to make errors and omissions, and lead to feeling irritable, angry and vulnerable to stress at work.

The negative *and positive* sleep-stress feedback loop

We've all been there: After a poor night's sleep, you wake up feeling exhausted. Instead of taking the time to prepare a nutritious breakfast, you grab something easy (or skip it altogether) and load up on extra caffeine. Since you're tired, it's harder to stay motivated to make balanced choices. You find yourself more irritable and less likely to manage your stress in a healthful way, such as through exercise or meditation.

That night, the unmitigated stress of your day makes it more challenging to fall and stay asleep. And the feedback loop continues.

Now, zoom out. That same thing happens regularly for members of your population. And the cumulative effects can be costly. Research confirms stress and sleep are closely linked.

43%

43% of adults report that stress has caused them to lie awake in the past month

Nearly a quarter of all adults report feeling more stressed when they don't get enough sleep, and for those with higher stress levels (8 to 10 on a 10-point scale), the situation is even worse (45%). Adults who sleep less than eight hours a night report higher stress levels than those who get the recommended amount of sleep. By contrast, adults with lower stress levels report sleeping more at night.[12]

Research also gives us insight into why. Each stage of sleep plays an important role in brain health, enabling better thinking, learning, and memory, and has profound impacts on emotional and mental health.[13]

During sleep, the brain works to evaluate and remember thoughts and memories, and it appears that a lack of sleep is especially harmful to the consolidation of positive emotional content. This can influence mood and emotional reactivity and is tied to mental health disorders and their severity.[14]

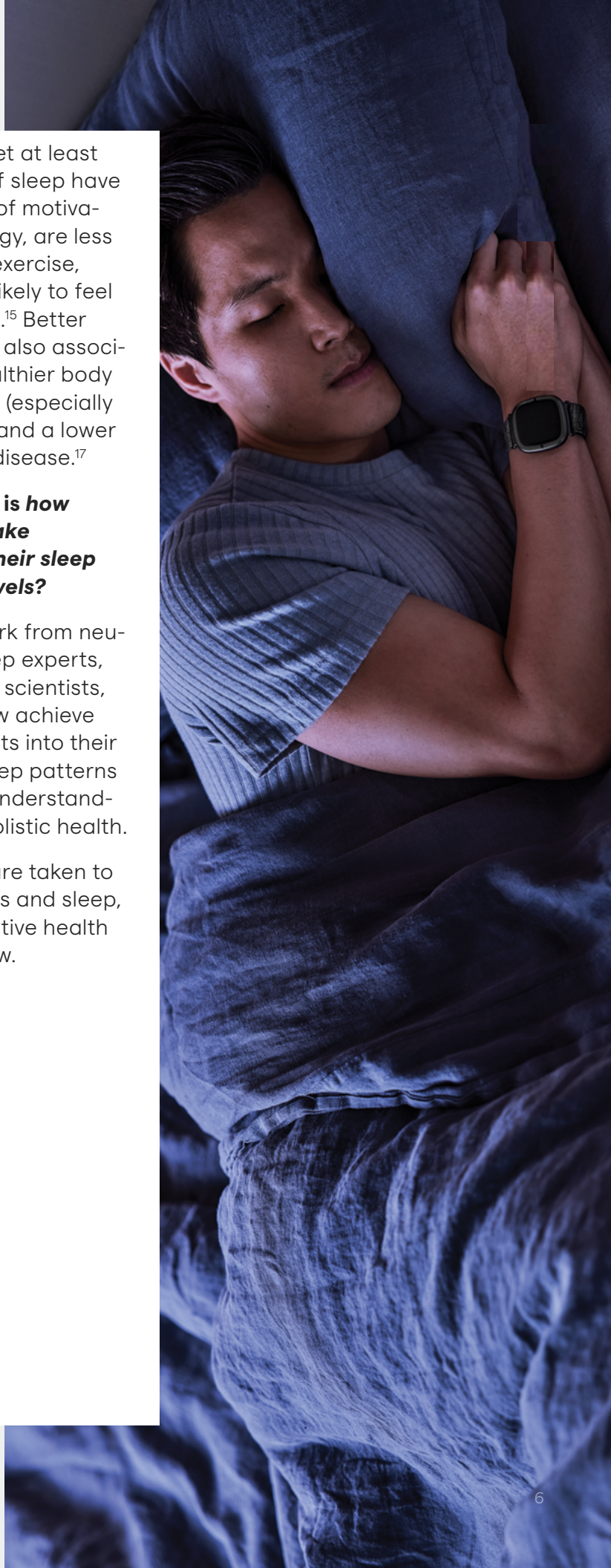
And just as the feedback loop can take a negative turn, it can just as easily take a decidedly positive one. Research suggests that consistent, quality rest has significant benefits.

Adults who get at least eight hours of sleep have higher levels of motivation and energy, are less likely to skip exercise, and are less likely to feel overwhelmed.[15] Better quality rest is also associated with healthier body composition[16] (especially older adults) and a lower risk of heart disease.[17]

The question is *how do people make changes to their sleep and stress levels?*

Thanks to work from neurologists, sleep experts, and research scientists, users can now achieve deeper insights into their long-term sleep patterns for a better understanding of their holistic health.

When steps are taken to improve stress and sleep, a host of positive health benefits follow.



Benefits of managing stress[18]

BETTER SLEEP

IMPROVES RELATIONSHIPS WITH FAMILY & FRIENDS

IMPROVES WEIGHT CONTROL

LESS MUSCLE TENSION

Benefits of getting a full night's rest[19]

IMPROVES ENERGY LEVELS & MOOD

PROMOTES CARDIAC HEALTH

REGULATES BLOOD SUGAR

IMPROVES MENTAL FUNCTION

7 ways wearable technology shines a light on sleep & stress patterns

What if you could help your population improve their sleep and stress levels by deploying a tool that supports personalized behavior change at scale? Today, wearable technology is giving users key insights into users' personal sleep and stress patterns that can provide them with the actionable guidance they need to test-drive healthy habits.

For example, tracking stress helps users understand patterns and identify triggers, such as what's regularly contributing to stress or the times of day stress normally occurs. Tracking sleep informs sleep efficiency, highlights sleep patterns, and can identify problem areas for change. And, knowledge is power when it comes to behavior change.

Users can now pull back the curtain for a better understanding of their sleep quality and stress levels.

Here are seven ways modern wearable technology can help your population understand their sleep and stress levels:

1. **STRESS MANAGEMENT SCORE:** A daily figure ranging from one to 100 that combines three metrics, including responsiveness, exertion balance, and sleep patterns. When the number is higher, the user is showing fewer physical signs of stress. When it's lower, users can manage its impact on their well-being by adjusting activity, improving sleep, or practicing deep breathing.
2. **PROMOTE PHYSICAL ACTIVITY:** Studies show that consistently using a fitness tracker or other wearable device can help people increase their step count by more than a mile each day, and added physical activity is linked to better sleep and reduced stress. Meanwhile, wearable tech can also shine a light on how caffeine or other foods may affect an individual's sleep and stress metrics over time.
3. **MOOD TRACKING:** From very calm to very stressed, your population can chart how they're feeling each day to gain awareness of their emotional well-being and how it changes over time. Together with a stress management score, this can give your users a holistic picture of how well they're handling stress.
4. **CONTINUOUS ELECTRODERMAL ACTIVITY (cEDA):** Users can measure their body's response to stress using a watch-embedded sensor that continuously tracks electrodermal activity—an indicator of changes in the sympathetic nervous system. The innovative multi-path sensor detects tiny electrical changes on the skin, and along with heart rate, heart rate variability, and skin temperature measurements, combine to assess stress levels. With their cEDA results, users can proactively pause for deep breathing exercise or build a mindfulness practice—one of the most effective stress reducers—to improve mental wellbeing over time.
5. **SLEEP TRACKING:** Advanced sleep tools allow users to access both their nightly sleep information and view critical trends over time. On a nightly basis, a Sleep Score tracks sleep and provides insights about a given night. A longer-term Sleep Profile analyzes sleep across 10 advanced health metrics each month, including disrupted sleep, sleep stability, and bedtime consistency. It calculates trends, and compares them to what's typical for a person's age and sex. In addition to the nightly insights, users get access to a comprehensive holistic view of their sleep patterns and quality so they can create better habits for better rest.
6. **FOOD & CAFFEINE TRACKING:** Users can track and monitor what they eat and drink throughout the day—including their caffeine intake—to help them better understand the relationship between what they consume and their sleep patterns and stress levels. These tools may help users learn to cut back on caffeine later in the day, avoid eating before bed, and, conversely, may help them realize that poor sleep and unchecked stress can lead to poor food choices.
7. **EDUCATION & PERSONALIZED GUIDANCE:** To better understand sleep and stress, users need contextual data to help them pinpoint areas to focus on improving. Wearables provide personalized guidance and context, giving users ideal ranges for each metric, and a clear picture as to where they fall within that range.

CONCLUSION: EMPOWERED TO CHANGE

When users have the right information about their sleep patterns and stress levels, they can see what is and isn't working for them. They can also catch negative trends early, heeding warning signs that can prevent a small issue from becoming a major one.

By providing a continuous view of physical activity, sleep data, and stress metrics, people can gain a deeper understanding of the interrelated connection between these health indicators, and use the feedback to improve their wellbeing over time. It all starts with having access to insights needed to build better habits around sleep routines and stress management.

Want to learn more about how to equip your population with the tools they need to build a strong sleep-stress foundation? Read *From Step Tracker to Health Companion: 6 Ways Fitbit Empowers Health & Wellbeing*.

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