



Hot Temperatures: The Reason Behind Not-So-Hot Sleep

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02/12/2026

For most people, as soon as May rolls around, their fireplaces have long been turned off, their hoodies have been stored away, and their heaters have begun to gather dust. However, for my mom, she clings to the belief that the middle of a Midwest summer is the perfect time to crank up her heater - even at night. Surprisingly, she's not alone. In fact, according to a OnePoll study done in March of 2020, 42% of Americans prefer to sleep in a warm room. But why? And why is it that doctors so strongly advise against doing so? Today, we'll delve deeper into the effects that different sleeping temperatures can have on one's physical and mental health, and explore new inventions and strategies that can help individuals sleep comfortably without raising the temperature.

Before we discuss the consequences of sleeping in a warm room, it's important to establish what qualifies a sleeping environment as 'warm'. Experts from the Whitney Sleep Center in June 2024 claim that an ideal sleeping temperature is between 65 and 68 degrees Fahrenheit; anything significantly higher than this range would be considered too hot. As further research proves, staying within this range prevents disruptions to the body's circadian rhythm and provides the consecutive downtime that the body needs to perform necessary tasks. As one begins to fall asleep, their body temperature decreases by two degrees Fahrenheit and continues to decline throughout the night as a sign of thermoregulation (the body's ability to regulate its temperature and keep it within stable boundaries). When one's body can do this comfortably, they will slowly drift into the three stages of REM, or rapid eye movement, sleep. This part of the night, when the brain is highly active, is incredibly crucial as it allows the brain to store and organize information learned throughout the day, regulate

the immune system, and complete muscle tissue repair. So, whether it's a student who needs to remember their notes for a test, an athlete who needs to heal their sore muscles, or someone who just wants to go into the next day feeling rested and refreshed, a good night's sleep is a non-negotiable.

Now, let's remember how this whole cycle started. If one's sleeping environment doesn't stay within the 65-68 degrees Fahrenheit range, none of the benefits of the REM cycle or thermoregulation can occur. When it is seen that 1 in 3 adults do not receive the medically recommended 7 hours of sleep every night, this dilemma explains the abundance of sleep apnea and insomnia in the United States. Dr. Pranshu Adavadar from the Sleep Apnea organization in September 2023 explains that sleeping in warm temperatures induces wakefulness, dehydration, and discomfort; in these conditions, the body isn't able to receive enough REM sleep. On the other hand, cooler outside temperatures lower the body's internal temperature, which enhances melatonin production to ease the body into REM sleep.

Despite the clear benefits of lowering the temperature, some adults, especially senior citizens, prefer a warmer night's rest. Surprisingly, sleeping warm may not be a horrible idea for them. Considering our internal body temperature naturally decreases as we age, it's challenging for people over 50 to keep their bodies warm, which is why a comfortable sleeping temperature for the elderly can reach 77° Fahrenheit. By contrast, 57% of American adults complain about being unable to sleep in hot temperatures, which is what puts heat as the third most common reason for inadequate sleep. Furthermore, in households where each person has different temperature preferences and changing the thermostat isn't an option, how can one still sleep comfortably without lowering the temperature?

The most common strategies to cool off before bed include wearing loose clothes, sleeping with thin blankets, and taking cold showers, yet cooling one's body can be done without even leaving the bed, with actions as simple as sticking one's feet out of the blanket. Humans' feet are comparatively hairless, making them fit to draw heat away from the body. Not only that, but the human foot also has unique blood vessels named arteriovenous anastomoses, the same vessels found in the nose and the nail beds of fingers and toes. Have you noticed that, whenever you're outside in wintertime, your fingers, toes, and nose get the coldest? That's because the arteriovenous anastomoses' job is to divert heat away from the body, giving the fingers, toes, and nose the ability to cool down the entire body. Additionally, other tactics such as closing the curtains, since light transmits heat and yields melatonin production, sleeping on the floor, because warm air rises, and refraining from exercising or eating before bed, all help maintain a cool, comfortable internal temperature.

Thanks to the ever-expanding technological innovation in today's world, there are plenty of options for those willing to splurge on a good night's rest. Around 2013, starting with the brand BedJet, climate-controlled beds were created to provide consistent sleep quality. Using air or water-based systems to regulate the mattress's temperature depending on body temperature, these beds have gained popularity among sleepers for their moisture-wicking and personalization capabilities, making them perfect for individuals who sleep when they sweat and partners with different temperature preferences. Climate-controlled bed brands, like Birch, also offer eco-friendly options with mattresses that are made with organic cotton and bamboo, making them appealing to consumers while benefiting the environment.

Scientific and international organizations have also begun exploring the possibilities of a climate-controlled mattress, particularly seen in Slumber Cloud products used for NASA astronauts and Japanese Arc-Chill bedding. Slumber Cloud was founded in 2013, and their products, crafted with textile technology, were originally intended to be used in NASA spacesuits at elevations that varied by 500 degrees from temperatures on Earth. Slumber Cloud comforters, sheets, and pillows are made of breathable materials and incorporate both Outlast and NASA cooling technologies to prevent heat buildup and sweat, adapt to the internal temperatures of thermally incompatible sleeping partners, and improve deep sleep. The same goes for Japanese Arc-Chill products that use cooling fabric technologies that trigger endothermic reactions to absorb body heat and counteract it by maintaining a cool exterior. Both of these brands provide excellent examples of how technology has adapted to increase convenience and comfort in the modern world.

As discussed, cool sleeping temperatures that fall between the 65-68° Fahrenheit range provide numerous benefits to the health of the body and the mind. Even as we drift away from summertime and ease into the colder seasons of Fall and Winter, it's important to consistently end the day with the best possible thing we can do for our body: give it a cool, comfortable night's rest.

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