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How Exposure to Light at Night Impacts Your Mental Health

Analysis by Dr. Joseph Mercola | December 07, 2023

STORY AT-A-GLANCE

- Light exposure at night is linked to psychiatric disorders, according to the largest such study to date
- More light exposure at night was linked to an increased risk of depression, anxiety, PTSD, bipolar disorder, psychosis and self-harm
- Greater exposure to light during the day was beneficial and was associated with a reduced risk for major depressive disorder, PTSD, psychosis and self-harm
- Exposure to high amounts of light at night was linked to a 30% increased risk of depression, while exposure to high amounts of light during the day lowered depression risk by 20%
- Light at night poses significant risks to your physical health as well, increasing the risk of several chronic conditions, including obesity, diabetes and high blood pressure

Since ancient times, humans have adapted to light from the sun during the day and darkness at night, save for light from the moon and stars, and the warm glow of fire. It's only been about a century since the invention of electric lights, which radically changed the way humans interact with daily light and darkness.

Soon after electric light bulbs were invented, night shift work began as humans found a way to extend "daylight" hours.[1] With the advent of television, computers, tablets and smartphones, humans are exposed to light at night at an unprecedented level.

This disruption to circadian rhythm, which is stabilized by bright light exposure during the day and complete darkness at night, is taking a toll on mental health. In the largest related study to date, it's revealed that light exposure at night is linked to psychiatric disorders.[2]

Light Exposure Is Associated With Psychiatric Disorders

Researchers with the Monash School of Psychological Sciences and the Turner Institute for Brain and Mental Health in Melbourne, Australia, used data from 86,772 adults to analyze the link between day and nighttime light exposure and risk of psychiatric disorders and self-harm.[3] More light exposure at night was linked to an increased risk of several such conditions, including:

Major depressive disorder	Generalized anxiety disorder
Post-traumatic stress disorder (PTSD)	Psychosis
Bipolar disorder	Self-harm behavior

In contrast, greater exposure to light during the day was beneficial and was associated with a reduced risk for major depressive disorder, PTSD, psychosis and self-harm. "Avoiding light at night and seeking light during the day may be a simple and effective, non-pharmacological means of broadly improving mental health," the team concluded.[4]

Indeed, exposure to high amounts of light at night was linked to a 30% increased risk of depression. But exposure to high amounts of light during the day lowered depression risk by 20%.[5] According to study author Sean Cain, an associate professor with Monash University's School of Psychological Sciences and Turner Institute for Brain and Mental Health:[6]

> *"Our brains evolved to work best with bright light in the day and then with almost no light at night. Humans today challenge this biology, spending around 90% of the day indoors under electric lighting, which is too dim during the day*

and too bright at night, compared to natural light and dark cycles. It is confusing our bodies and making us unwell."

Even after adjusting for other factors that might influence mental health, like physical activity, sleep quality and cardiometabolic health, the associations remained strong.

"Our findings will have a potentially huge societal impact," Cain said. "Once people understand that their light exposure patterns have a powerful influence on their mental health, they can take some simple steps to optimize their well-being. It's about getting bright light in the day and darkness at night."[7]

Disrupting Your Circadian Rhythm Alters Your Brain, Mood

Exposure to light leads to advances or delays in your circadian rhythm, known as phase shifts. Typically, exposure to light early in the morning causes a phase advance, which leads to earlier waking. Light exposure at bedtime will lead to a phase delay, or later wakening.

A number of biological processes are controlled by your circadian rhythm — and disrupted when it's thrown off. This includes sleep-wake behavior, hormone secretion, cellular function and gene expression.[8]

The function of brain regions that regulate emotions and mood is also affected by circadian disruption. Altered neuroplasticity and neurotransmission may occur, and exposure to light at night may affect mood both directly and indirectly. According to a review in Translational Psychiatry:[9]

"Nighttime light can indirectly affect mood by disrupting sleep, hormone secretion, neuroplasticity, neurotransmission or gene expression. In parallel, nighttime light can directly affect mood through aberrant signals transmitted from ipRGCs [intrinsically photosensitive retinal ganglion cells] in the retina to brain regions involved in emotional regulation."

In humans, the incidence of depression has grown along with the use of electric lights. While this is only a correlation, it's interesting to note that Amish populations, which have no electricity, have low rates of depression.[10]

Further, in older adults, intensity and duration of exposure to light at night are linked with symptoms of depression. Those who were depressed were exposed to an average of more than five lux of light at night for more than 30 minutes, while those who were not depressed were exposed to only 0.8 lux of light nightly.[11] For context, a residential side street gives off about five lux of light, while a tablet gives off 40 lux.[12]

Physical Health Risks of Light Exposure at Night

Aside from mood, light at night poses significant risks to your physical health, increasing the risk of several chronic conditions. In March 2022, a study of 20 healthy young adults revealed that even one night of sleep with moderate light exposure increased nighttime heart rate, decreased heart rate variability and increased next-morning insulin resistance.[13]

In another study, exposure to any amount of light at night was linked detrimental effects on the health of older adults, increasing the risk of obesity, high blood pressure and diabetes.[14] Compared to adults who were not exposed to light at night, those who did experience light exposure at night were significantly more likely to be obese or have high blood pressure or diabetes. Specifically:[15]

- 40.7% of those exposed to LAN were obese, compared to 26.7% of those not exposed
- 17.8% of those exposed to LAN had diabetes, compared to 9.8% of those not exposed
- 73% of those exposed to LAN had high blood pressure, compared to 59.2% of those not exposed

Artificial Light at Night a 'Probable Human Carcinogen'

Because it involves exposure to artificial light at night, shift work has been categorized as a probable carcinogen that induces circadian disorganization, which in turn is linked to elevated rates of cancer, diabetes, cardiovascular risks, obesity, mood disorders and age-related macular degeneration.[16]

It's previously been shown that higher exposure to outdoor light at night may increase the risk of postmenopausal breast cancer,[17] and evidence suggests light at night may increase thyroid cancer risk, too,[18] as thyroid function is regulated by circadian rhythm.

Further, nighttime exposure to light inhibits the secretion of melatonin, which can cause circadian disruptions that play a role in cancer.[19] One study followed 464,371 participants in the National Institutes of Health-American Association of Retired Persons Diet and Health Study for an average of 12.8 years. Satellite data was used to estimate nighttime light exposure, which was then linked to residential addresses, while thyroid cancer cases were followed via state cancer registries.

A positive association was found between light exposure at night and thyroid cancer risk, with those in the highest quintile of nighttime light exposure having a 55% increased risk of thyroid cancer compared to those in the lowest quintile. Aside from helping you sleep, melatonin may help prevent cancer, acting as a "full-service anticancer agent," inhibiting the initiation, progression and metastasis of cancer.[20]

Light and Darkness Control Your Sleep

The other reason why exposure to light at night is disruptive to your mood and health is because it's disruptive to sleep. Sleep problems are associated with many mental health disorders,[21] and blocking out ambient light at night is essential to a good night's sleep. This is one reason why wearing a sleep mask may improve your sleep — and indirectly, your mood.

For instance, a 2017 systematic review published in the Journal of Sleep Research analyzed the use of sleep masks for patients in an intensive care unit (ICU).[22] ICUs are

filled with bright lights and noise, and sleep deprivation in ICU settings can lead to worse outcomes, including longer ICU stays and increased complication rates.[23]

The study revealed that use of sleep masks, as well as ear plugs, by ICU patients significantly improved subjective sleep quality. Yet, exposure to light at night isn't only an issue in hospital settings. As reported by the Translational Psychiatry review:[24]

> *"According to the National Sleep Foundation, 36% of parents and 34% of children leave an electronic device such as a television or computer on in their room while sleeping. In addition, 87% of women watch television in the hour before bedtime. This amount of nighttime light exposure is unprecedented in human history."*

Considering how widespread exposure to light at night is, taking steps to minimize your exposure — along with getting bright light exposure during the day — is essential for good health.

You Must Limit Blue Light Exposure After Sunset and Before Sunrise

The screens of electronic devices such as smartphones, computers, tablets, and televisions can emit blue light that disrupts our natural sleep cycles. Research shows that a majority of Americans use electronic devices within an hour of going to bed, which can lead to unsatisfactory sleep. Decreasing exposure to light in the evening, and blue light in particular, is an important way to help your body naturally prepare for sleep and get quality rest.

Exposure to blue light in the hours leading up to bedtime can hinder sleep. Blue light suppresses the body's release of melatonin. While this promotes wakefulness during the day, it becomes unhelpful at night when we are trying to sleep. Being exposed to blue light in the evening can trick our brain into thinking it is still daytime, disrupting circadian rhythms and leaving us feeling alert instead of tired.[25]

The way you can help lower your exposure to blue light is to make sure your filter out the blue light from all sources after sunset and before sunrise. This is virtually a non-issue in the summer months for most but a serious challenge for most that live in higher latitudes in the winter when there might be as little as six hours of daylight or even less the closer to the pole you get.

Fortunately most iOS and Android devices have filters in their operating system to effectively remove all blue light. You can search for how to do this in YouTube for your operating system and you will find very detailed instructions on how to use these tools.

It is a bit more complicated for your computer and you will need to purchase some software to achieve the same result. F.Lux is a popular application but my favorite is **Iris**. I have been using it personally and in my company for the last seven years and couldn't endorse more strongly.

For your bedroom I would strongly recommend non-flicker red LED bulbs. They are about 3 watts and have zero blue light. They are typically less than $5 in most online stores.

If for some reason you are not in your home environment you will want to consider authentic blue blocking glasses. Just be careful as most glasses advertising this capability only partially filter blue light and are not effective. The key will be the color of the lens which will be orange.

If you have a clear lens it likely is incapable of blocking blue light but you can easily test this for yourself by looking at a blue light through the lens. The blue light should be invisible and if you can see blue the lenses clearly are not blocking blue light.

How to Use Light and Dark for Better Health

In the video above, Andrew Huberman, a neuroscientist and tenured professor in the department of neurobiology at Stanford University School of Medicine, details how to harness light and darkness, as well as other factors, to fall asleep faster and stay asleep longer.

Huberman recommends viewing bright light, ideally from sunlight, within the first 30 to 60 minutes after waking to stimulate wakefulness throughout the day and help you fall asleep at night. Later in the day, there's research showing that if you view light in the early evening hours, it may help to mitigate some of the consequences of light exposure later in the evening.[26]

However, from around 6 p.m. or 7 p.m., into the hours when you get into bed and throughout the night while you're asleep, it's important to avoid bright artificial lights of any color.

To achieve this, once the sun goes down you should dim the lights in your environment and use as little artificial light as possible, including dimming your computer screen and avoiding overhead lights — opting for desk lamps instead. Better yet, use candlelight or moonlight after sunset.

If your bedroom is affected by light pollution, be sure to use blackout shades to keep light out and remove all sources of light from your bedroom, including a digital alarm clock or cellphone. You can also use a sleep mask and blackout shades for this purpose.

In addition to tending to light exposure, I've compiled **33 tips to optimize your sleep routine**, which include tips for sleep hygiene, temperature, lifestyle choices and more. If your mood is currently suffering, try to check as many of these tips off the list as possible. This, combined with proper exposure to light and darkness, may be what's needed to get your mind into a better place.

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