

How Sunlight Affects Your Mental Health

Analysis by [Dr. Joseph Mercola](#)

October 04, 2024

STORY AT-A-GLANCE

- › Sunlight has a profound impact on your mental health. Out of 19 environmental factors, the only one correlating to higher levels of distress was the amount of time between sunrise and sunset
- › An estimated 20% of Americans are affected by Seasonal Affective Disorder (SAD) each winter. What differentiates SAD from regular depression is that full remission occurs in the spring and summer months
- › The complex stimulus of sunlight affects your mood and mental health through a number of mechanisms, including affecting your vitamin D, serotonin, endorphins, nitric oxide levels and mitochondrial energy

Editor's Note: This article is a reprint. It was originally published December 1, 2016.

Sunlight has a profound impact on your mental health – more so than any other weather phenomenon. That's the conclusion of a study¹ looking at links between weather and depression.²

Mental health data from more than 16,000 Brigham Young University students was used. Assessments had been filled out several times by each person over the course of six years. Each assessment was then matched to local weather data.

Nineteen different environmental factors, including solar irradiance (the amount of sunlight reaching the Earth), cloud cover, rain, wind chill, barometric pressure and smog levels were accounted for.

In the end, the only factor that really mattered was the amount of time between sunrise and sunset. None of the other factors had any significant association with emotional distress – provided there was enough sunlight.

This doesn't surprise me. It's been estimated³ that as many as 20% of Americans are affected by Seasonal Affective Disorder (SAD) each winter, suffering from the blues, fatigue and in some cases, more serious depression, as sunlight grows scarce.

What differentiates SAD from regular depression is that full remission occurs in the spring and summer months.

Depression Rates Rise During Fall and Winter

Indeed, as the days got shorter through fall and winter, self-reports of depression rose, whether the student had been diagnosed with SAD or not. According to the authors:⁴

"These findings suggest the need for institutions and public health entities to plan for intervention and prevention resources and strategies during periods of reduced sun time."

The researchers note that more research is needed to evaluate related factors such as vitamin D intake, amount of time actually spent outdoors and sunbed use. Indeed, a deficiency of the vital nutrient of vitamin D, which is counteracted with vitamin D3 supplements, is strongly associated with a higher risk of depression.

For example, research has shown having a **vitamin D** level below 20 nanograms per milliliter (ng/mL) raises your risk for **depression** by as much as 85%, compared to having a vitamin D level greater than 30 ng/mL. A number of studies have also confirmed that vitamin D supplementation helps alleviate symptoms of depression.⁵

A study published in 2015,⁶ which looked at healthy women aged 18 to 25 who lived in the Pacific Northwest during the fall, winter and spring, found that vitamin D insufficiency (30 ng/ml or lower) could predict the emergence of clinically significant

depressive symptoms. The link remained even after controlling for factors such as season, body mass index, race, diet, exercise and time spent outdoors.

By the fourth and final week of the study, 46% of the women had insufficient levels of vitamin D, and during the course of the study up to 42% of them showed signs of clinically significant depression, based on the Center for Epidemiologic Studies Depression scale. As reported by HCP Live:⁷

"Vitamin D supplements are inexpensive and readily available,' [lead author David] Kerr concluded, adding that the findings are consistent with literature that supports seasonal depressive symptoms."

I don't recommend using oral vitamin D to address this problem unless absolutely necessary. Vitamin D levels in the above study likely correlate well with SAD as they indicate sunlight exposure. When you separate the sunlight from vitamin D by swallowing it, I suspect you are dramatically reducing the mental benefits.

Sun Exposure Affects Health in Many Ways Besides Vitamin D

When we talk about sun exposure to optimize vitamin D production, we're really only looking at a small portion of the action spectrum of light, because ultraviolet B (UVB) radiation is the only portion able to photosynthesize vitamin D in your skin.

But the health effects and benefits of sunlight are not restricted to UVB. Swiss specialist Dr. Auguste Rollier, who has written textbooks on heliotherapy, emphasized that the composition of the different parts of the light spectrum is of crucial importance to achieve all of the benefits you get from the sun.

According to Dr. Alexander Wunsch, a German physician and one of the world's leading experts in photobiology, humans are adapted to **sunlight** as a complex stimulus, and when you remove that stimulus (sunlight), you end up with a variety of problems. As noted by Wunsch in a previous interview:

"Sunlight induces coordinated endocrine adaptation effects. It affects sympathetic and parasympathetic activity, and is a major circadian and seasonal stimulus for the body clock ... Our system, via the eyes and via the skin, detects the colors of the light in the environment in order to adapt the hormonal system to the specific needs of the time and place."

How Sunlight Influences Your Mood

According to a paper published in the journal *Dermato-Endocrinology*,⁸ a large number of molecules (chromophores) found in the different layers of your skin absorb and interact with ultraviolet rays, producing a number of complex and synergistic effects.

There are additional chromophores in your mitochondria electron transport chain that respond to near-infrared light. This complex stimulus of sunlight affects not only your physical health by preventing diseases, but it also impacts your mood and mental health. For example:

- Your body uses the near-infrared light spectrum to produce mitochondrial energy and maintain systemic equilibrium.

Near-infrared also primes the cells in your retina for repair and regeneration, which explains why light-emitting diode (LED) lighting – which is devoid of infrared – is so harmful for your eyes.

Now, if near-infrared plays such an important role in your body's energy production, it seems reasonable to conclude that if you're running low on adenosine triphosphate (ATP) – cellular energy – due to insufficient amounts of sunlight exposure, you'd start feeling sluggish and tired, and possibly depressed.

- Sunlight also regulates your circadian rhythm, and light therapy has been shown to be effective against depression, both SAD and non-seasonal major depression. When it's dark, your melatonin levels increase, which is why you feel tired when the sun starts to set. In the heart of winter, this may be as early as 4:00 p.m.

- Ultraviolet light also stimulates epidermal cells known as keratinocytes to make beta-endorphins, which have a mood-boosting effect.
- UVA light generates nitric oxide (NO) in your skin, which influences your body in a number of beneficial ways. It stimulates up to 60% of your blood to flow to your skin capillaries where they absorb this energy and infrared radiation.

The UVA actually helps kill any infections in your blood while the infrared recharges your cellular battery.

NO also protects your heart by relaxing your blood vessels and lowering your blood pressure, stimulates your brain and acts as a natural antioxidant. By lowering inflammation, it could have a beneficial impact on your mental health, as depression is strongly linked to chronic, low-grade [inflammation](#).

Part of why vitamin D appears to improve depression relates to the fact that it's a potent anti-inflammatory.

Vitamin D Deficiency Predisposes You to Depression

Getting back to vitamin D, there's ample evidence suggesting vitamin D plays an important role in mental health, so if fall and winter months leave you feeling blue, you'd be wise to get your levels checked. If you're below 40 ng/mL, a vitamin D supplement would be advisable.

- In one 2006 study, seniors with vitamin D levels below 20 ng/ml were found to be 1,100% more prone to be depressed than those with higher levels⁹
- A 2007 study suggested that vitamin D deficiency is responsible for symptoms of depression and anxiety in patients with fibromyalgia¹⁰
- Vitamin D deficiency is also a well-recognized cause in SAD¹¹
- A double-blind randomized trial published in 2008 suggested there's a CAUSAL relationship between low vitamin D levels and depression, noting that high doses of vitamin D were effective at ameliorating symptoms of depression¹²

- In a 2011 study, the authors also pointed out that:¹³ "Effective detection and treatment of inadequate vitamin D levels in persons with depression and other mental disorders may be an easy and cost-effective therapy which could improve patients' long-term health outcomes as well as their quality of life"

Based on the evaluation of healthy populations that get plenty of natural sun exposure, the optimal range for general physical and mental health appears to be somewhere between 40 ng/ml. However, that's only for sufficiency. For optimal wellness, I recommend you aim for a range between 60 ng/mL and 80 ng/mL.

So, if you're depressed, get your vitamin D level checked to address any insufficiency or deficiency. The [D*Action Project](#) by GrassrootsHealth is one cost-effective testing solution.

Just keep in mind that if you opt for a vitamin D supplement, you also need to take calcium, [vitamin K2](#) and magnesium, as these nutrients work in tandem. Also, since vitamin D is fat-soluble, taking it with some form of healthy fat will help optimize absorption. Vitamin A, zinc and boron are other important cofactors that interact with vitamin D.

Other Tips for Beating the Winter Blues

Light is a major factor in overcoming SAD and depression, but there are other ways to boost your mood naturally during the dark, cold winter by:

1. **Exercising** — Regular physical activity has been found to work better than antidepressant drugs. In fact, it's one of the most powerful strategies available to prevent and treat depression and [boost your mood](#).

Exercise works by helping to normalize your insulin levels while simultaneously boosting "feel good" hormones in your brain. Researchers have also discovered that exercise allows your body to eliminate kynurenine, a harmful protein associated with depression.¹⁴

2. Going to sleep early and/or addressing insomnia – The link between depression and lack of sleep is well established. Of the approximately 18 million Americans with depression, more than half of them struggle with insomnia. While it was long thought that insomnia was a symptom of depression, it now seems that insomnia precedes depression in some cases.¹⁵

In one study, 87% of depression patients who resolved their insomnia had major improvements to their depression, with symptoms disappearing after eight weeks. Other research also found that **sleep therapy** resulted in remarkable improvements in depressed patients.

While there are individual differences, as a general rule, aim for about eight hours of sleep per night. If you don't already have a fitness tracker that records your sleep, I would encourage you to get one. It's difficult to change a habit when you're not monitoring it, and chances are you're not getting nearly as much sleep as you think you do.

Using a sleep tracker will motivate you to get to bed earlier so you get eight hours of sleep. Just remember to protect yourself from the device's electromagnetic radiation appropriately.

3. Avoiding processed foods – A factor that cannot be overlooked is your diet. Foods have an immense impact on your mood and ability to cope, and eating a diet of fresh, whole foods will best support your mental health.

Processed foods, most of which are chockful of refined sugar, processed fructose and synthetic chemicals, are known to have a very detrimental impact on your brain function and mental health in general. Cutting out artificial sweeteners will also eliminate your chances of suffering their toxic effects.

4. Optimizing your gut health – Fermented foods such as fermented vegetables are also important for optimal mental health, as they are key for optimizing your gut health. Many fail to realize that your **gut** is literally your second brain, and

significantly influences your mind, mood and behavior. Your gut actually produces more mood-regulating serotonin than your brain does.

A Note on Sun Exposure

Nothing beats sunlight when it comes to producing vitamin D in your body. However, there are some precautions to remember, especially if you've been eating a diet high in linoleic acid (LA). These oils migrate to your skin and oxidize when exposed to sunlight, causing inflammation and DNA damage that makes you more prone to sunburn.

What's the best approach, then? Avoid intense sun exposure during solar noon, only going out during early morning and late afternoon for four to six months as you reduce your LA intake to less than 5 grams. If you can get it below 2 grams, that's even better.

Throughout this period, the safest way to know if you've had enough sun exposure is when your skin develops the slightest hint of pink. Keep doing that, adding several minutes each day until you can get under the sun during solar noon without developing sunburn. To help you on this transition, consider taking the following:

- **Low-dose aspirin** – Ingest a low dose 30 to 60 minutes before going under the sun. Aspirin helps prevent LA from turning into oxidized linoleic acid metabolites (OXLAMs).
- **Molecular hydrogen (H₂)** – This molecule helps combat oxidative stress, adding another layer of protection against the seed oils embedded in your skin.

Sources and References

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