

Higher Vitamin D Levels Linked to Improved Mental Health

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STORY AT-A-GLANCE

- › Higher vitamin D levels are associated with improved mental health, particularly in depression. Studies show low vitamin D levels increase depression risk, while supplementation can improve symptoms in some cases
- › Vitamin D receptors are present in crucial brain regions, influencing neuron development, growth factor production and neurotransmitter synthesis. This connection may explain its potential impact on mental health conditions
- › Research suggests vitamin D supplementation may help regulate or suppress seizures in people with epilepsy. One study found an average 40% reduction in seizures after supplementation
- › Maintaining adequate vitamin D levels could reduce the risk of depression, especially in younger adults who are surprisingly more prone to deficiency. Every 20-year decrease in age increased deficiency risk by 37.1%
- › Sun exposure is the optimal source of vitamin D, offering benefits beyond just vitamin D production. However, sensible exposure is important, particularly for those with high vegetable oil consumption

Vitamin D has long been known for its crucial role in bone health, but it has body-wide effects and may be just as important for your mental well-being. A comprehensive systematic review examined the effects of vitamin D supplementation on various mental and neurological disorders, including depression, bipolar disorder, schizophrenia, epilepsy and neuroinflammation.¹

The findings indicate that vitamin D could play a significant role in managing these conditions. Interestingly, vitamin D receptors are present in various crucial brain regions, where it influences neuron development, growth factor production and neurotransmitter synthesis.²

This connection between vitamin D and brain function may explain its potential impact on mental health. The review, published in the journal *Diseases*, found that vitamin D deficiency is prevalent among individuals with mental health disorders, revealing a link between low vitamin D levels and the development or exacerbation of these conditions.³

Sun exposure is the best way to raise your vitamin D level. That said, if you've been eating a diet high in vegetable oils or seed oils, you need to be cautious, as these oils increase your risk of sunburn. That's why I recommend avoiding high-intensity sun exposure unless you've been off these oils for at least four to six months.

Vitamin D Offers a Ray of Hope for Depression

When it comes to depression, the research on vitamin D's effectiveness shows promising results. Several studies have found that lower levels of vitamin D are associated with more severe depressive symptoms. In fact, a meta-analysis published in *The British Journal of Psychiatry* revealed that low vitamin D levels were linked to a significantly higher risk of depression.⁴

Some randomized controlled trials have shown that vitamin D supplementation can lead to significant improvements in depression scores, particularly in overweight and obese individuals.⁵ The effect of vitamin D on depression could be attributed to its role as a unique neurosteroid hormone.

As a neurosteroid, vitamin D supports neurotrophic factors, provides neuroprotection and contributes to brain development. It's also thought to influence the serotonergic system and help maintain healthy circadian rhythms, both of which are associated with mood regulation.

Epilepsy: Seizing Control with Vitamin D

Your vitamin D levels may also play a crucial role if you're dealing with epilepsy. Research has shown that individuals with epilepsy frequently have inadequate levels of vitamin D, defined as a 25-hydroxyvitamin D3 concentration less than 20 ng/mL. Preclinical research and preliminary human data suggest that vitamin D3 may help regulate or suppress seizures through both membrane-based and genomic mechanisms.⁶

One study found that in a group of people with epilepsy, there was an average 40% reduction in seizures after subjects were given vitamin D supplementation.⁷ Notably, 38% of the participants experienced a 50% or greater reduction in their seizure frequency.

Another study demonstrated that low serum vitamin D levels were prevalent in 86.8% of the 542 people with epilepsy that were examined, underscoring the importance of regular vitamin D screening for individuals with epilepsy.⁸ This intervention could help reduce the risk of future complications and potentially improve seizure control.

Vitamin D for Bipolar Disorder and Alzheimer's Disease

While the evidence for vitamin D's benefits in depression and epilepsy is compelling, the results for other mental health conditions are mixed. In bipolar disorder, some studies have found elevated levels of vitamin D binding protein in patients, suggesting a potential link to inflammation.⁹ However, the impact of vitamin D supplementation on bipolar symptoms remains unclear.

For schizophrenia, the relationship with vitamin D is even more complex. Although vitamin D deficiency is common in individuals with schizophrenia, studies have not consistently shown benefits from supplementation.

When it comes to neuroinflammation, animal studies have demonstrated promising results, with vitamin D therapy shown to reduce inflammation in rat models of traumatic

brain injury.¹⁰ Additionally, vitamin D deficiency has been associated with an increased risk of neurodegenerative diseases like Alzheimer's and vascular dementia.¹¹

Vitamin D and Mental Health: New Insights

Recent research presented at the American Society for Nutrition's annual NUTRITION meeting also shed light on the relationship between vitamin D levels and mental health, particularly depressive symptoms. Dr. Jacqueline A. Vernarelli, associate professor at Sacred Heart University in Connecticut, and her research partner, Kayla D. Champagne, analyzed data from 4,641 adults who participated in the 2017-2018 National Health and Nutrition Examination (NHANES) survey.¹²

Their findings revealed a significant connection between vitamin D levels and mental health outcomes. Adults with lower levels of vitamin D in their blood exhibited more depressive symptoms, while those with depression had significantly lower intake of vitamin D compared to adults without depression.

This large-scale study provides compelling evidence for the importance of maintaining adequate vitamin D levels for your mental wellbeing.

The researchers suggest that public health messaging encouraging the consumption of vitamin D-rich foods could be an essential dietary strategy to support mental health, although sensible sun exposure is the ideal way to boost your vitamin D levels – and supplementation may be necessary for some people, especially during winter months or for those with limited sun exposure.

In addition to its impact on mental health, the study also uncovered a link between vitamin D levels and physical functioning. Higher serum vitamin D levels were associated with improved physical performance.¹³ This means **addressing vitamin D deficiency** offers not only benefits for mood improvement but also for enhanced physical capabilities and overall quality of life.

Vitamin D May Reduce Lifetime Depression Risk in Those Who Are Deficient

Recent research has employed a powerful technique called Mendelian randomization to investigate the causal relationship between vitamin D levels and mental health outcomes.¹⁴ This method uses genetic variants associated with vitamin D levels as proxies to assess the impact of vitamin D on various conditions. A large-scale study using data from 333,025 participants in the UK Biobank found intriguing results.

While there was no strong evidence for a linear relationship between vitamin D levels and conditions like fibromyalgia, clinical fatigue or chronic widespread pain across the entire population, the study revealed a potential threshold effect for depression.¹⁵

Specifically, individuals with the lowest levels of genetically-predicted vitamin D showed a reduced risk of probable lifetime major depression when their vitamin D levels increased. The genetic approach helps overcome limitations of observational studies, providing more reliable evidence for a causal link between vitamin D and depression in those with low levels.

Vitamin D's Complex Role in Brain Health

The relationship between vitamin D and mental health is multifaceted. Vitamin D receptors are present in various brain regions, indicating its importance in neurological function. Additionally, vitamin D has been observed to have anti-inflammatory effects in the brain, potentially preventing oxidative damage to nervous tissue.

Some studies have even suggested a connection between vitamin D and the gut microbiome,¹⁶ which is increasingly recognized for its role in mental health. These diverse mechanisms highlight why addressing vitamin D deficiency could be particularly important for your brain health, especially if your levels are low.

However, the complexity of these interactions also explains why the effects of vitamin D supplementation may not be uniform across all individuals or all mental health

conditions.

Vitamin D Deficiency: A Hidden Risk Factor for Depression

A large-scale study analyzing data from 15,156 U.S. adults also found that vitamin D deficiency is significantly associated with an increased risk of depression.¹⁷ Specifically, individuals with adequate vitamin D levels were about 24% less likely to experience depression compared to those who were deficient. This finding held true even after accounting for various factors like gender, race, education and marital status.

The implications are clear: maintaining healthy vitamin D levels could be an effective strategy for safeguarding your mental health. Vitamin D influences mood through several mechanisms, including regulating calcium levels in brain cells.

Contrary to popular belief, the study revealed that younger adults may actually be at higher risk for vitamin D deficiency than older individuals. For every 20-year decrease in age, the likelihood of vitamin D deficiency increased by 37.1%.¹⁸ This unexpected finding challenges previous assumptions and highlights the importance of vitamin D awareness across all age groups.

Younger people's higher metabolic rates and potentially greater physical activity levels might contribute to their increased vitamin D needs. However, when it comes to depression, the study confirmed that risk does increase with age. For each 20-year increase in age, the prevalence of depression rose by 9.2%.¹⁹

This age-related increase in depression risk may be attributed to various factors, including physiological changes in the brain, accumulated life experiences and increased social isolation among older adults. These findings underscore the complex interplay between age, vitamin D status and mental health.

Vitamin D's Impact on Specific Mental Health Conditions

While depression has been the primary focus of [vitamin D research in mental health](#), studies have revealed its potential influence on other conditions as well.²⁰ For instance, vitamin D deficiency has been linked to an increased risk of schizophrenia, with some research suggesting that prenatal vitamin D deficiency may be a risk factor. In bipolar disorder, lower vitamin D levels have been observed.

[Anxiety disorders](#) have also shown a potential connection to vitamin D status, with some studies indicating that supplementation may improve anxiety symptoms.²¹ Interestingly, vitamin D deficiency has been associated with obsessive-compulsive disorder and post-traumatic stress disorder (PTSD) as well.

In neurocognitive diseases like Alzheimer's, low vitamin D levels correlate with a higher degree of cognitive impairment,²² underscoring the wide-reaching impact of vitamin D on various aspects of mental health.

By taking proactive steps to maintain optimal vitamin D levels and adopting a healthy lifestyle, you can help reduce your risk of depression and other mental health conditions and support your mental health throughout your lifespan.

Natural Sunlight: The Optimal Source of Vitamin D

Obtaining vitamin D through proper sun exposure is highly recommended, as it offers benefits beyond just vitamin D production. In fact, higher vitamin D levels may indicate healthy sun exposure, which could be responsible for many health benefits attributed to vitamin D, including reduced cancer risk and increased longevity.

Regular sunlight exposure also boosts melatonin production, a powerful anticancer agent.²³ That said, while sun exposure is essential for vitamin D production and health, it can also be harmful if you're not careful. The key is understanding how to protect yourself while still reaping the benefits. So, let's talk about some strategies that can help you do that.

If you've been eating a diet high in vegetable oils or seed oils, you need to be extra cautious with sun exposure. These oils are rich in [linoleic acid](#) (LA), an omega-6 fat that

is highly prone to oxidation when exposed to ultraviolet (UV) radiation. When sunlight interacts with skin containing these oils, it causes the oils to break down, leading to inflammation and DNA damage.

That's why I recommend avoiding sun exposure unless you've been off these oils for at least four to six months. Your individual physical characteristics also influence your relationship with the sun. Skin color, determined by melanin content, is a prime example.

Melanin acts as a natural sunscreen, meaning darker-skinned individuals require more sun exposure to produce the same amount of vitamin D as those with lighter skin. This biological variation emphasizes the need for personalized approaches to sun exposure.

Body composition, particularly fat percentage, is another crucial factor. Adipose tissue can store fat-soluble compounds, including oxidized vegetable oils. Individuals with higher body fat may therefore need to be more cautious, as these stored oils can prolong the risk period even after dietary changes.

The best way to assess your sun exposure, especially if you have a history of consuming vegetable oils, is to monitor your skin for any signs of redness or burning. This simple "sunburn test" considers the time of year, skin type and more. If you don't notice even the slightest hint of pink on your skin, it's a good sign that your sun exposure was within a safe range. Always aim to avoid sunburn, as it indicates overexposure.

As you lower your body's stores of LA, your risk of sunburn and skin cancer decreases dramatically. However, it's still important to be mindful of your sun exposure, especially during the transition period. As you begin reducing vegetable oils in your diet, avoid peak sunlight hours, which are typically an hour before and after solar noon.

In most of the U.S. during summer, this means staying out of direct sun from 11 a.m. to 3 p.m. during Daylight Saving Time, or 10 a.m. to 2 p.m. in Standard Time. Over time, as your body detoxes the accumulated seed oils, you can gradually increase your time in the sun. Eventually, you will be able to enjoy an hour or more of peak sunlight hours.

Remember, everyone's skin is different, so listen to your body during this adjustment period. The key is to never let your skin burn. Sunburn is a sign of damage, so if you notice any redness, seek shade at once. By being mindful of your sun exposure, you're taking an important step in caring for your health.

Tips for Safer Sun Exposure

If you do need to spend time in the sun before your body has fully cleared out seed oils, there are some protective strategies you can implement. One of my favorite recommendations is astaxanthin, a powerful antioxidant found in certain marine life. Taking 12 milligrams of astaxanthin once a day can help increase your skin's resistance to sun damage. It works by neutralizing free radicals and reducing inflammation. This gives your skin extra protection against UV radiation.

Another helpful tool in your sun-protection arsenal is niacinamide cream. Niacinamide, also known as vitamin B3, has been shown to help protect against UV-induced DNA damage when applied topically. It can also improve your skin's barrier, making it more resilient to stressors like sun exposure. I've seen patients have remarkable success with applying niacinamide cream before sun exposure.

Here's a tip that might surprise you. Taking a baby aspirin 30 to 60 minutes before sun exposure could lower your risk of skin cancer. Aspirin prevents the LA in your skin from turning into harmful compounds called OXLAMs (oxidized linoleic acid metabolites). These OXLAMs are a primary contributor not just to skin cancer but to many types of cancer. By inhibiting their formation, aspirin can provide an extra layer of protection against sun damage.

Molecular hydrogen (H₂) offers another layer of protection against sun damage and mitigates the harmful effects of vegetable oils. This remarkable molecule works at the cellular level, effectively reducing oxidative stress by neutralizing harmful free radicals, with a particular affinity for the highly reactive hydroxyl radical. H₂'s unique properties allow it to penetrate cell membranes easily, directly targeting sources of inflammation and oxidative damage.

Importantly, it does this without interfering with beneficial reactive oxygen species (ROS), maintaining the body's delicate oxidative balance. Beyond this protective role, molecular hydrogen also provides other benefits, including increased energy levels, and enhanced recovery. This makes H₂ a valuable tool in your arsenal for supporting cellular health, especially when facing environmental stressors like sun exposure or dietary challenges from vegetable oil consumption.

If you can't get enough sun daily, vitamin D supplements may be necessary. Vitamin D deficiency and insufficiency are prevalent globally, affecting 40% to 100% of the population.²⁴

The current definition of deficiency (less than 20 ng/mL) has been shown to be inadequate for good health and disease prevention, suggesting an even higher prevalence of suboptimal vitamin D levels. To determine your ideal sun exposure or supplement dosage, it's crucial to measure your vitamin D levels twice a year.

After testing, adjust your sun exposure or vitamin D3 supplementation accordingly. Retest in three to four months to ensure you've reached your target level. The optimal range for health and disease prevention is 60 to 80 ng/mL (150 to 200 nmol/L), with sufficiency starting around 40 ng/mL (100 nmol/L in Europe). Regular testing and adjustments will help you maintain ideal vitamin D levels for your health.

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