

# The Impact of Vitamin D and Magnesium on Fibromyalgia Symptoms

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## STORY AT-A-GLANCE

- › Fibromyalgia affects approximately 4 million U.S. adults, causing widespread musculoskeletal pain, fatigue, sleep disorders and various systemic symptoms
- › A July 2024 study revealed a correlation between low vitamin D and magnesium levels and the severity of fibromyalgia symptoms, highlighting the importance of optimizing these nutrients
- › Vitamin D helps fibromyalgia by influencing brain signal processing, neuronal regulation and reducing inflammation; magnesium can alleviate symptoms by inhibiting the NMDA receptor and reducing stress
- › Sunlight exposure is ideal for increasing vitamin D levels, but there are some considerations to keep in mind, especially if you've been consuming seed oils
- › You can increase your magnesium levels through lifestyle and dietary changes. More strategies to improve fibromyalgia symptoms are also included below

It is estimated that 4 million U.S. adults are affected by fibromyalgia, a chronic condition characterized by widespread musculoskeletal pain and stiffness.<sup>1</sup> Fibromyalgia is more common in women than in men, and typically affects individuals between the ages of 30 and 50.<sup>2</sup>

This condition can make it challenging to perform daily activities due to persistent discomfort and other debilitating symptoms. While it has no known cure, fibromyalgia

can be managed through a combination of treatments aimed at improving quality of life.

An exploratory cross-sectional study published in July 2024 in the European Review for Medical and Pharmacological<sup>3</sup> provides further insights into the mechanism of fibromyalgia, revealing two key nutrients that may affect the severity of its symptoms – vitamin D and magnesium.

## Fibromyalgia Symptoms and Diagnosis

For many years, fibromyalgia was often dismissed as a psychological or psychosomatic disorder, with some healthcare professionals attributing its symptoms to stress, depression or anxiety instead of recognizing it as a distinct condition. The lack of clear diagnostic criteria and the absence of objective laboratory tests contributed to skepticism about its validity as a genuine medical disorder.<sup>4</sup>

In 1990, the American College of Rheumatology established diagnostic criteria for fibromyalgia, which contributed to a broader acceptance of it as a legitimate condition. Its exact cause is still not fully understood, but research has linked it to central nervous system dysfunction, specifically improper processing of pain signals in the brain, resulting in increased pain sensitivity.<sup>5</sup>

While there are no lab tests for fibromyalgia, it can be diagnosed based on two criteria: 1) experiencing widespread pain that has persisted for more than three months, and 2) the presence of other systemic symptoms,<sup>6</sup> including:<sup>7,8</sup>

Fatigue	Sleep disorders	Cognitive impairment
Anxiety and depression	Migraine	Irritable bowel syndrome
Raynaud's phenomenon	Restless leg syndrome	Irritable bowel and bladder
Skin sensitivities and rashes	Dry eyes and mouth	Impaired coordination

Conventional treatment typically involves pain medication or psychotropic drugs like antidepressants. I don't recommend either of these as they fail to address the root cause of the problem. Many fibromyalgia sufferers also do not respond to conventional painkillers, leading to a dangerous cycle of overmedicating on these drugs.

## **Vitamin D and Magnesium Deficiency Linked to Worse Fibromyalgia Symptoms**

The featured study,<sup>9</sup> conducted by researchers from various Italian institutions, aimed to investigate the link between fibromyalgia symptoms and specific micronutrients. "The management of FM [fibromyalgia] needs a multidisciplinary approach involving pharmacological and nonpharmacological strategies," the authors noted. "Among nonpharmacological approaches, nutrition plays a cardinal role."

The researchers specifically focused on vitamin D, magnesium, vitamin B12 and iron supplementation, as these nutrients have shown promising results in clinical trials. They measured the blood levels of these micronutrients in 20 Italian women diagnosed with fibromyalgia, as well as in 20 healthy controls. The severity of the patients' symptoms was also evaluated using a Fibromyalgia Impact Questionnaire (FIQ).

Interestingly, while they found no significant differences in micronutrient levels between fibromyalgia patients and healthy controls, a closer analysis within the fibromyalgia group revealed that higher vitamin D levels were associated with better physical functioning, while higher magnesium levels were linked to lower levels of stiffness. The authors concluded:<sup>10</sup>

*"Screening for micronutrient deficiencies in FM patients is useful in clinical practice. Supplementation in patients – even when not deficient – should be considered due to the inverse association between vitamin D and magnesium levels and physical function/stiffness."*

## **The Role of Vitamin D in Musculoskeletal Health**

The researchers also conducted a comprehensive review<sup>11</sup> of the existing literature on micronutrients' impact on fibromyalgia, particularly highlighting vitamin D for its potential benefits in alleviating fibromyalgia symptoms, especially in patients with deficiencies.

"Vitamin D supplementation is being considered in the management of FM because approximately 40% of patients are vitamin D deficient," the authors wrote. "Furthermore, several studies have suggested that reduced serum level of vitamin D is associated with chronic pain, depression and anxiety in patients with FM." They elaborated on the mechanisms through which vitamin D exerts its effects:<sup>12</sup>

*"Vitamin D is involved in brain development and neuronal regulation, it can increase neuronal growth factors, reduce neuronal excitability and supply neuroprotective effects. Vitamin D upraises the transforming growth factor- $\beta$ 1 (TGF- $\beta$ 1), opposing the elevated inflammatory cytokines in FM patients.*

*Furthermore, considering that reduced bone mineral density (BMD) appears to be linked to the severity of FM pain, vitamin D is known to be part of the symptomatology itself. Finally, vitamin D has several intramuscular actions, such as increasing strength and preserving the mass of the muscle."*

## **How Magnesium Helps Improve Fibromyalgia Symptoms**

As for magnesium, the authors noted<sup>13</sup> that a deficiency is associated with symptoms commonly seen in fibromyalgia, such as muscle weakness, paresthesia ("pins and needles" sensation in the hands, arms and legs) and low-grade inflammation. Additionally, a diet low in this mineral has been linked to a reduced pain threshold in fibromyalgia patients.

Magnesium's pain-relieving effects are attributed to its ability to inhibit the N-methyl-D-aspartate (NMDA) receptor, which plays a role in central sensitization and pain hypersensitivity.<sup>14</sup> Magnesium may not only help alleviate pain but also reduce stress

linked to fibromyalgia, as shown in another study published in May 2022 in the journal *Nutrients*.<sup>15</sup>

The researchers found that supplementing with magnesium daily for a month helped improve mild to moderate stress while reducing pain. "This suggests that daily magnesium could be a useful treatment to improve the burden of disease of fibromyalgia patients," they concluded.<sup>16</sup>

## How to Increase Your Magnesium Levels

There is no easy blood test to determine your magnesium levels, but one way to determine your status is to carefully evaluate and track your symptoms, which are discussed in the video above. Also, be aware that certain lifestyle choices can deplete your magnesium stores, and certain dietary choices may not provide you with enough daily magnesium.

One of the primary reasons for magnesium deficiency is a diet rich in processed foods, as heat and processing deplete magnesium from real foods. Certain drugs also tend to reduce the amount of magnesium in your body, such as antibiotics, proton pump inhibitors and corticosteroids. To naturally increase your magnesium levels, add well-cooked vegetables into your diet, such as:

Spinach	Collard greens	Swiss chard
Turnip greens	Beet greens	Broccoli
Brussels sprouts	Kale	Bok choy
Romaine lettuce	Squash	Dried seaweed or agar

While obtaining magnesium from dietary sources like dark leafy greens is ideal, supplemental forms of magnesium can also help you ensure adequate intake. When it comes to oral supplementation, my personal preference is magnesium threonate, as it

appears to be the most efficient at penetrating cell membranes, including your mitochondria and blood-brain barrier.

The daily magnesium requirements vary by age and gender, with adult men needing approximately 400 milligrams (mg) and women requiring about 300 to 350 mg.

Magnesium is also lost through sweating during heavy exertion, lack of sleep and alcohol consumption. Active individuals and those who sweat significantly (e.g., through exercise or sauna use) may need 10% to 20% more than the Recommended Dietary Allowance (RDA) to compensate for magnesium loss through sweat.

## **Sunlight Is the Best Source of Vitamin D, but Keep These Caveats in Mind**

I recommend getting your vitamin D from proper sun exposure, if possible, as it provides benefits beyond vitamin D optimization, such as a reduced risk of cancer,<sup>17</sup> enhanced melatonin production<sup>18</sup> and increased longevity.<sup>19</sup> However, while sun exposure is crucial for vitamin D production and overall health, it can also be harmful if you're not careful.

The benefits of sun exposure can be influenced by your diet, environment and physiology. By understanding these factors, you can make the most of sunlight while safeguarding your health. Here are some key strategies to consider:

**Avoid seed oils for safer sun exposure** — One of the most important factors you need to address before spending time in the sun is your diet. Seed oils, which are high in linoleic acid (LA), can significantly impact your skin's reaction to UV exposure, as LA oxidizes when your skin is exposed to UV rays, leading to inflammation and DNA damage.

If your diet consists of foods that contain seed oils, be careful with sun exposure. I recommend avoiding high intensity sun exposure until you've been off these oils for at least four to six months.

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**Adapt to your geographical and environmental conditions** — Factors like altitude and atmospheric conditions influence how sun exposure affects you. Be mindful of local atmospheric conditions like cloud cover and air pollution, which can block UVB rays, reducing both its benefits and risks.

If you live in higher altitudes, the thinner atmosphere lets more UVB rays reach the Earth, making sun exposure more intense. On the other hand, places with long winters or overcast skies naturally limit your sun exposure. Even if you're still consuming seed oils, the risk is lower in winter since you aren't as exposed to UV radiation.

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**Personalize your approach** — Your physical characteristics, such as skin color and body composition, influence how you should manage sun exposure. Darker skin has more melanin and requires more sun to produce the same amount of vitamin D as lighter skin.

Body composition also plays a key role. Higher body fat can store fat-soluble compounds, including oxidized vegetable oils. People with more body fat might need to be extra cautious, as these stored oils can increase the risk of sun damage even after changing your diet.

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**Pay close attention to your skin** — Your skin can clue you into how much exposure is too much. To determine if the time you're spending under the sun is safe, especially if you've been consuming seed oils, watch out for signs of redness or burning. UV rays interacting with vegetable oils in your skin can increase the risk of sunburn and skin cancer over time.

To protect yourself, avoid letting your skin burn, as it indicates overexposure. If you notice any redness, seek shade at once. 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. As you reduce linoleic acid in your diet, your risk of sunburn and skin cancer will drop significantly, but stay cautious, especially during the transition period.

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**Avoid peak sunlight hours during the transition period** – This is 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.

As your body clears out accumulated seed oils, you can gradually extend your sun exposure. Over time, you should be able to safely enjoy an hour or more during these peak sunlight hours.

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**Use protective aids during the transition period** – If you need to spend time in the sun before your body has fully detoxed accumulated seed oils, these compounds can offer valuable support:

- **Astaxanthin** – This powerful antioxidant helps increase your skin's resistance to sun damage. Taking 12 mg daily can neutralize free radicals and reduce inflammation, providing extra protection against UV radiation.
- **Niacinamide cream (vitamin B3)** – Applying niacinamide topically before going under the sun can help improve your skin's barrier and protect against UV-induced DNA damage.
- **Baby aspirin** – When taken 30 to 60 minutes before sun exposure, it may help lower your risk of skin cancer by inhibiting the formation of harmful oxidized linoleic acid metabolites (OXLAMs) in your skin.
- **Molecular hydrogen (H<sub>2</sub>)** – H<sub>2</sub> provides an extra layer of protection against sun damage and mitigates the effects of vegetable oils. It operates at the cellular level by neutralizing harmful free radicals, especially hydroxyl radicals. It can also penetrate cell membranes to target inflammation and oxidative damage directly at the source while preserving beneficial reactive oxygen species (ROS).

Beyond its protective role, H<sub>2</sub> boosts energy levels and enhances recovery, making it a valuable support for cellular health, particularly when dealing with sun exposure and dietary challenges from vegetable oils.

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## Tips for Vitamin D Supplementation

If you're unable to get adequate sun exposure, vitamin D supplementation may be necessary. While some guidelines recommend 40 ng/mL (100 nmol/L) as an optimal dose, I believe that's only the cutoff for sufficiency.

For health and disease prevention, I recommend you aim for optimal levels between 60 ng/mL and 80 ng/mL. In Europe, the measurements you're looking for are 150 to 200 nmol/L, respectively.

To determine how much vitamin D3 you need to take, measure your vitamin D level, ideally twice a year. It's important to remember that calcium, vitamin D3, magnesium and vitamin K2 must be properly balanced for optimal overall health.

If you find supplementation is necessary after a serum vitamin D test, also supplement with magnesium and vitamin K2 (MK-7) to ensure proper balance. Then, remember to retest in three to four months to make sure you've reached your target level.

## Other Strategies to Improve Fibromyalgia Symptoms

Aside from optimizing your magnesium and vitamin D levels, implementing these strategies may help you alleviate fibromyalgia symptoms and improve overall well-being:

- 1. Try whole-body vibration therapy** – Research suggests whole-body vibration therapy may help patients with fibromyalgia. In a 12-week study<sup>20</sup> involving 60 fibromyalgia patients, researchers found that those who participated in the therapy showed improvements in motor function and gait speed, as measured by various tests.

To learn more about how to utilize this form of treatment, check out my article "[Utilize the Power of Vibrations to Promote Wellness.](#)"

- 2. Reduce your EMF exposure** – Electromagnetic fields (EMFs) from devices like cell phones, Wi-Fi routers, and other electronics may exacerbate fibromyalgia

symptoms by disrupting the metabolic processes linked to pain and oxidative stress, as well as promoting inflammation.<sup>21</sup>

Reducing your exposure through simple measures such as turning off Wi-Fi at night, using wired connections instead of wireless, minimizing cell phone usage, incorporating EMF shielding devices and creating a low-EMF environment in your home can make a difference in reducing symptom severity.

**3. Practice Emotional Freedom Techniques (EFT)** – EFT is a mind-body technique that combines elements of cognitive therapy and acupuncture by tapping on specific meridian points on the body while reciting positive affirmations. This technique may help reduce stress and emotional triggers, which can directly impact physical pain.

For fibromyalgia patients, EFT may help alleviate both the emotional and physical aspects of the condition. You can do this yourself, at home, and it takes just a few minutes to learn. For a demonstration, see the video below.

## Sources and References

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