

Development and Intensity of Chronic Pain is Influenced by Vitamin D

A New Systemic Review Finds that Vitamin D Levels Influences the Intensity of Pain, with Higher Levels Related to Better Outcomes Among Individuals at Risk of Developing Chronic Pain



CHRONIC PAIN affects approximately 30% of adults worldwide, negatively influencing quality of life, increasing the risk of disabilities, and poorly affecting social relationships. Pharmaceutical drugs often produce insufficient pain relief while also increasing the risk of side effects and addiction.

Meanwhile, vitamin D deficiency has consistently been linked to higher pain intensity, a known risk factor for chronic pain. Observational studies have found that low vitamin D levels are associated with musculoskeletal pain, myalgia, chronic lower back pain, and chronic headaches. It has also been shown that appropriate vitamin D supplementation can result in enhanced pain relief among individuals with certain pain conditions. One study showed a high risk of vitamin D deficiency among those experiencing persistent, nonspecific musculoskeletal pain; supplementation decreased pain, suggesting that the pain could be due to vitamin D deficiency itself.

COULD VITAMIN D HELP PREVENT THE DEVELOPMENT OF CHRONIC PAIN?

Sometimes, acute pain, due to circumstances or conditions such as surgery, trauma, lower back pain, osteoarthritis, chemotherapy and radiation, can transition into long-term chronic pain. A new systematic review by Abrego-Guandique et al. (June, 2025) explored the existing published evidence to determine if there is a relationship between vitamin D levels and the transition from acute to chronic pain; 14 different studies were included in the review.

KEY FINDINGS: VITAMIN D STATUS AND PAIN TRANSITION

While low vitamin D levels may not directly cause the transition from acute to chronic pain, the study found that they are associated with higher pain intensity, a risk factor for chronicity. Specific associations include:

- Post-surgical patients with low vitamin D levels had higher acute postoperative pain and a greater risk of persistent pain at 3 months.
- Chemotherapy patients with vitamin D deficiency had a higher risk and severity of neuropathic pain (CIPN).

- Lower back pain patients with more severe vitamin D deficiency had worse outcomes, suggesting a potential link between vitamin D and chronic musculoskeletal pain.
- Inflammation: Vitamin D was inversely correlated with IL-6 levels and pain scores, especially in chronic pain patients.

KEY FINDINGS: VITAMIN D SUPPLEMENTATION AND PAIN OUTCOMES

Supplementation did not consistently prevent the transition from acute to chronic pain but often reduced pain intensity or improved quality of life. Appropriate doses of vitamin D were beneficial in:

- Reducing pain in aromatase inhibitor-associated musculoskeletal symptoms (AIMSS).
- Attenuating postoperative pain when combined with rehabilitation.
- Some trials found no significant effect (e.g., Niravath et al. for AI-induced arthralgia), while others suggested that achieving a vitamin D level of at least 40 ng/ml was necessary for pain relief benefits.

Overall, vitamin D levels were found to affect the intensity of pain and sufficient levels were related to better outcomes among individuals at risk of developing chronic pain. The effects of vitamin D on pain reduction are likely through its impact on pain perception and inflammation. The study also concluded that there is evidence that vitamin D plays a role in preventing some forms of persistent pain, and that vitamin D deficiency may increase the intensity of postoperative pain and increase the chances of the development of chronic conditions, such as low back pain, arthrosis, and chemotherapy neuropathy.

In conclusion, maintaining adequate vitamin D levels may improve acute pain outcomes and reduce the likelihood of chronic pain development, especially in high-risk groups like surgical and chemotherapy patients.



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