# Higher Vitamin D Levels Linked to Lower Odds of Fatty Liver Disease

People with vitamin D levels well above the sufficiency threshold had markedly lower likelihood of having MASLD and significant liver fibrosis.

March 13, 2026 By Sukanya Charuchandra

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Higher vitamin D levels are associated with significantly lower odds of having metabolic dysfunction-associated steatotic liver disease (MASLD), according to findings published in Nutrients. The study showed that people with the highest vitamin D concentrations had a 61% lower likelihood of fatty liver disease compared to those with the lowest levels.

MASLD and its more severe form, metabolic dysfunction-associated steatohepatitis (MASH), are responsible for a growing proportion of advanced liver disease worldwide. As a result of inflammation, the buildup of fat in the liver can lead to fibrosis, cirrhosis and liver cancer. With only two approved medications (Rezdiffra and Wegovy), management still largely depends on lifestyle changes such as weight loss and exercise.

Low levels of vitamin D have been associated with various metabolic conditions. While vitamin D is crucial for good liver health, the level needed to protect against disease progression in people with MASLD are unknown. Sufficiency levels for vitamin D are based on requirements for bone health, not for liver fat or fibrosis development.

Gediz Dogay Us, PhD, of Maastricht University in the Netherlands, and colleagues assessed the link between adequate vitamin D levels and MASLD in a Turkish population. They recruited more than 1,000 adults with cardiometabolic risk factors, of whom 834 had complete records on vitamin D levels. The average age was 52 years, and 52% were men. Most (82%) had sufficient vitamin D levels—defined as 20 nanogram per milliliter or higher—45% had obesity and 55% had MASLD.

Liver fat and MASLD were less common among people with adequate vitamin D levels. As vitamin D levels rose, fewer people had fatty liver disease. On the flipside, people with MASLD had lower vitamin D levels compared with those without the condition.

When the researchers looked at vitamin D levels as either sufficient or insufficient, sufficient levels were linked to a 53% lower risk of MASLD and a 54% lower risk of advanced liver fibrosis. Once they took into account various confounding factors, they noted that sufficient vitamin D levels were associated with a 40% lower risk of MASLD, though the difference was not statistically

significant. However, the link between vitamin D sufficiency and advanced fibrosis persisted even after adjusting for these variables.

When vitamin D levels were divided into quartiles, people in the highest quartile had 61% lower odds of MASLD compared with those in the lowest quartile, after adjusting for other factors. For every 1 ng/ml increase in vitamin D levels, the risk of MASLD fell by 2%. This benefit was evident in all subgroups to varying degrees, including people with metabolic syndrome, hypertension, obesity and diabetes.

“Vitamin D insufficiency is associated with higher odds of MASLD in a dose-dependent manner, independent of metabolic syndrome and its components,” wrote the researchers. “While the protective effect on fibrosis was not dose-dependent, these findings collectively suggest vitamin D as a potentially modifiable factor in MASLD prevention and management.”

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