

Vitamin D supplements can keep bones strong—but they may also have other benefits to your health

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Most of us don't worry about getting vitamin D when the weather's warm and the sun is shining. But as winter approaches, accompanied by overcast days and long nights, you may be wondering if it could be

useful to take a vitamin D supplement—and what benefit it might have.

During the summer, the best way to get vitamin D is by getting a bit of sunshine. Ultraviolet rays (specifically UVB, which have a shorter wavelength) interact with a form of cholesterol called [7-dehydrocholesterol](#) in the skin, which is then converted into vitamin D.

Because vitamin D production is dependent on UVB, this means our ability to make it [declines in the winter months](#). Vitamin D production also [depends on where you live](#), with people living nearer to the equator making more vitamin D than those living nearer the poles.

Vitamin D deficiency is a [problem in the UK](#) during the winter months. This is due to its northerly position and cloudy weather, and lack of time spent outdoors.

One study of over 440,000 people in the UK found that [18% were vitamin D deficient](#) during the winter months. Vitamin D deficiency was even higher in certain [ethnic groups](#)—with the data showing 57% of Asian participants and 38% of black participants were vitamin D deficient. This is because the melanin content of skin determines a person's ability to [make UVB into vitamin D](#).

Given the prevalence of vitamin D deficiency in the UK, and the importance it has for our health, in 2016 the UK's Science Advisory Council on Nutrition outlined recommendations for the [amount of vitamin D](#) people should aim to get in the winter.

They recommend people aim to get ten micrograms (or 400 IU—international units) of vitamin D per day. This would help people avoid severe deficiency. This can be achieved either by taking a [supplement](#), or eating [certain foods](#) that are rich in vitamin D—including fatty fish such as herring, mackerel and wild salmon. A 100 gram

serving of fresh herring, for example, would have approximately five micrograms of vitamin D.

The clearest benefit of taking a vitamin D supplement is for [bone health](#). In fact, vitamin D was [first discovered](#) 100 years ago because of its ability to prevent the disease rickets, which causes weak bones that bend.

Although rickets [isn't very common](#) in the UK today, it can still occur in children if they lack vitamin D. In adults, vitamin D deficiency can cause bone pain, tenderness and muscles weakness, as well as increased risk of osteomalacia—often called "soft bone disease"—which leads to weakening or softening bones.

The reason a lack of vitamin D can have such an effect on [bone health](#) is due to the vitamin's relationship with [calcium and phosphate](#). Both of these minerals help keep our bones strong—but they require vitamin D in order to be able to reinforce and strengthen bones.

Other health benefits

In addition to its effects on the skeleton, a growing body of research is beginning to indicate that vitamin D supplements may have additional benefits to our health.

For example, [research shows](#) there's a link between vitamin D deficiency and increased risk of catching certain viral illnesses, including the [common cold](#), [flu](#) and [COVID](#).

Similarly, several studies—[including my own](#)—have demonstrated in cell models that vitamin D promotes immunity against microbes, such as the bacteria which causes tuberculosis. This means vitamin D may potentially prevent some types of infections.

Vitamin D may also dampen inflammatory immune responses, which could potentially protect against [autoimmune diseases](#), such as [multiple sclerosis](#) and [rheumatoid arthritis](#).

One 2022 trial, which looked at over 25,000 people over the age of 50, found taking a 2,000 IU (50 micrograms) vitamin D supplement each day was associated with an [18% lower risk](#) of autoimmune disease—notably rheumatoid arthritis.

Vitamin D supplements may also be linked with lower risk of cardiovascular disease. A [major Australian study](#), which looked at over 21,000 people aged 60-84, found that participants who took a 2,000 IU vitamin D supplement a day for five years had a lower risk of suffering a major cardiovascular event (such as stroke or [heart attack](#)) compared to those who didn't take a supplement.

It's currently not known why vitamin D may have these benefits on these other areas of our health. It's also worth noting that in many of these trials, very few of the participants were actually vitamin D deficient. While we might speculate the observed [health benefits](#) may be even greater in people with vitamin D deficiency, it will be important for future research to study these factors.

While it's too early to say whether vitamin D supplements have broad health benefits, it's clear it's beneficial for [bone](#) health. It may be worthwhile to take a supplement in the winter months, especially if you're over 65, have darker skin or spent a lot of time indoors as these factors can put you at [increased risk of vitamin D deficiency](#).

The research also shows us that we should be rethinking vitamin D supplementation advice. While in the UK it's recommended people get 400 IU of [vitamin](#) D a day, many trials have shown 2,000 IU a day is associated with [health](#) benefits.

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