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# People with vitamin D deficiency at higher risk of severe COVID-19, says study

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Caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the coronavirus disease 2019 (COVID-19) causes respiratory illness, vast inflammation, and in some cases, a [cytokine storm \(/health/What-is-Cytokine-Storm.aspx\)](/health/What-is-Cytokine-Storm.aspx) – the latter of which can be fatal.

Some people are at a higher risk of severe coronavirus disease (COVID-19), typically due to underlying health conditions. As the pandemic evolves, however, many health experts have found that nutrient deficiency can also help contribute to severe illness.

In particular, recent evidence shows that vitamin deficiency can be tied to severe COVID-19.

A new study has revealed that vitamin D deficient patients are more likely to experience severe COVID-19.



Study: [Effect of Vitamin D deficiency on COVID-19 status: A systematic review \(https://www.medrxiv.org/content/10.1101/2020.12.01.20241612v1\)](https://www.medrxiv.org/content/10.1101/2020.12.01.20241612v1). Image Credit: Kavun Halyna / Shutterstock

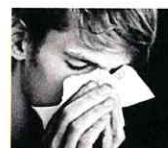
The study, which appeared on the pre-print [medRxiv \(https://www.medrxiv.org/content/10.1101/2020.12.01.20242313v1\)](https://www.medrxiv.org/content/10.1101/2020.12.01.20242313v1)\* server, tackled the findings of previous studies on vitamin D deficiency and COVID-19.

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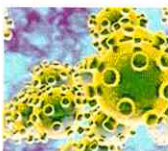
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## Vitamin D and COVID-19

One major micronutrient known to have a possible protective or mitigating effect against SARS-CoV-2 is vitamin D. Past studies have shown how vitamin D provides benefit for patients with COVID-19. A naturally occurring vitamin in humans, vitamin D is produced when the skin is exposed to ultraviolet radiation from the sun. It can also be obtained from the diet.

Since COVID-19 is tied to immune hyperactivation, the protective effect of vitamin D has been attributed to its ability to suppress immune responses to the virus, thereby reducing the risk of severe acute respiratory distress syndrome (ARDS), a fatal complication of COVID-19 that is linked to an overreaction on the part of the immune system.

The dietary intake of vitamin D plays an imperative role in determining one's vitamin D status. Some foods, mainly coldwater fish like herring, sardines, mackerel, and salmon, contain vitamin D. Meanwhile, some doctors recommend vitamin D3 supplementation in the form of tablets.

The striking link between vitamin D deficiency and the development of common COVID-19 risk factors like obesity and older age has influenced scientists to theorize that vitamin D supplements could be used as a preventive and protective agent against SARS-CoV-2 infection.

Some researchers also noted that since COVID-19 is linked to immune hyperactivation and a cytokine storm, vitamin D can help prevent severe illness. Vitamin D regulates immunopathological inflammatory responses and supports innate antiviral effector mechanisms, hence boosting the immune system to work harder during an infection.

## The study

The study highlights the importance of having sufficient vitamin D levels in the body to combat the coronavirus pandemic.

To arrive at the study findings, the researchers conducted a meta-analysis by conducting a wide-reaching search for studies related to vitamin D and COVID-19 from three databases, including PubMed, ScienceDirect, and Google Scholar.

The search consisted of keywords such as vitamin D, 25-Hydroxyvitamin D, low vitamin D, COVID-19, SARS-CoV-2, coronavirus, or 2019-nCoV. They also searched for terms such as disease severity, ICU admission, and mortality.

Overall, the team included titles and abstracts of 2,774 articles. From there, they screened the full text of 17 articles.

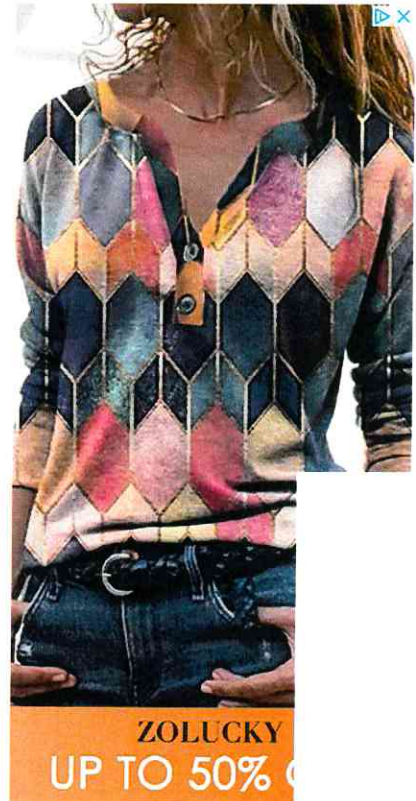
The team found that in one particular study, vitamin D deficient patients were 5.84 times more likely to die from COVID-19 compared to

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people with sufficient vitamin D levels. Another study showed that vitamin D deficiency is tied to a higher risk of death.

Further readings of the selected articles showed that after controlling for confounders, patients with low 25-Hydroxyvitamin D have more risk of testing positive for COVID-19. The team also found that the SARS-CoV-2 positivity rate is lower in patients with adequate 25-Hydroxyvitamin D levels in the body.

"Findings from the study included suggest Vitamin D may serve as a mitigating effect for covid19 infection, severity, and mortality," the team concluded in the study.

"We recommend the need to encourage people to eat foods rich in vitamin D such as fish, red meat, liver, and egg yolks while at the same time providing vitamin D supplements for individuals with COVID-19 to boost their immune systems," the team added.

Finding ways to mitigate the ongoing pandemic is imperative. So far, 65.23 million people have been infected with SARS-CoV-2. Of these, at least 1.50 million have died.

Scientists and pharmaceutical companies are racing to develop effective antivirals and vaccines to mitigate or prevent SARS-CoV-2 infection. While the world waits for a safe and effective vaccine, it is crucial to observe basic infection control measures, such as physical distancing, regular hand hygiene, and masks. Also, sustaining the body with adequate amounts of nutrients can boost the immune system to fight off pathogens, as this meta-analysis's findings emphasize.

### \*Important Notice

medRxiv publishes preliminary scientific reports that are not peer-reviewed and, therefore, should not be regarded as conclusive, guide clinical practice/health-related behavior, or treated as established information.

#### Source:

- COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU) - <https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6> (https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6)

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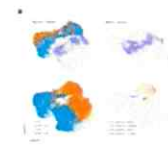
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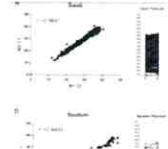
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