# Evidence Search Service Results of your search request

## Vitamin D supplementation for staff and patients to prevent and treat COVID-19

**ID of request:** 23750  
**Date of request:** 12th June, 2020  
**Date of completion:** 15th June, 2020

If you would like to request any articles or any further help, please contact:  Jason Curtis at [jason.curtis1@nhs.net](mailto:jason.curtis1@nhs.net)

Please acknowledge this work in any resulting paper or presentation as: Evidence search: Vitamin D supplementation for staff and patients to prevent and treat COVID-19. Jason Curtis. (15th June, 2020). SHREWSBURY, UK: Shrewsbury and Telford Health Libraries.

**Sources searched**  
Centre for Evidence-Based Medicine (1)  
Google Scholar (1)  
MEDLINE (4)

**Date range used** (5 years, 10 years): April 2020 -   
**Limits used** (gender, article/study type, etc.): None   
**Search terms and notes** (full search strategy for database searches below):

Relevant natural language and controlled vocabulary terms were selected and combined. Final result sets were de-duplicated and reviewed for relevance by the searcher, irrelevant results being discarded.

Searched: PubMed, Medline, EMBASE, CEBM, UpToDate, Google Scholar

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## Summary of Results

A review by the Centre for Evidence-Based Medicine conducted in April found no clinical evidence on Vitamin D in COVID-19.

Another more recent paper also found no evidence. The paper by Hastie (5) using Biobank UK data found no link between Vitamin D levels and risk of COVID-19 infection, nor any evidence that Vitamin D concentrations may explain ethnic differences in COVID-19 infection.

However, some new studies do appear to found some evidence. The paper by D'Avolio (1) concerned a small cohort of patients and found lower levels of Vitamin D in patient who were tested positive for COVID-19 than those that tested negative. The paper by Meltzer (2) used a retrospective cohort study, and suggests that Vitamin D deficiency is associated with higher COVID-19 risk. The paper by Illie (3) found a correlation between mean levels of Vitamin D in different European countries, and the number of COVID-19 cases and mortality.

A review in BMJ Nutrition, Prevention and Health (4) looked at some of the evidence around ARTIs and Vitamin D, and recommended supplementation in line with UK Government recommendations (400 IU/day (10 µg/day)). This paper made the point that people that have been self-isolating indoors may be deficient in Vitamin D. It also cautions that until there is more robust scientific evidence for vitamin D (such as randomised controlled trials), to avoid the use of high vitamin D supplementation (greater than the upper limit of 4000 IU/day (100 µg/day)).

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### [C. Search History](#SearchHistory)

## A. Synopses or Summaries

#### Centre for Evidence-Based Medicine

**Vitamin D: A rapid review of the evidence for treatment or prevention in COVID-19** (2020)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=5aa4332263a5eba1298db05b7bdccb8c)

We found no clinical evidence on vitamin D in COVID-19. There was no evidence related to vitamin D deficiency predisposing to COVID-19, nor were there studies of supplementation for preventing or treating COVID-19 (Search date upto 4th of April 2020, clinicaltrials.gov searched upto on 23rd April).

## B. Original Research

1. **25-Hydroxyvitamin D Concentrations Are Lower in Patients with Positive PCR for SARS-CoV-2.**  
   D'Avolio Antonio Nutrients 2020;12(5):No page numbers.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes coronavirus disease 2019 (COVID-19), with a clinical outcome ranging from mild to severe, including death. To date, it is unclear why some patients develop severe symptoms. Many authors have suggested the involvement of vitamin D in reducing the risk of infections; thus, we retrospectively investigated the 25-hydroxyvitamin D (25(OH)D) concentrations in plasma obtained from a cohort of patients from Switzerland. In this cohort, significantly lower 25(OH)D levels (p = 0.004) were found in PCR-positive for SARS-CoV-2 (median value 11.1 ng/mL) patients compared with negative patients (24.6 ng/mL); this was also confirmed by stratifying patients according to age >70 years. On the basis of this preliminary observation, vitamin D supplementation might be a useful measure to reduce the risk of infection. Randomized controlled trials and large population studies should be conducted to evaluate these recommendations and to confirm our preliminary observation.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=262ba4033cd59f0429eb78c468e618e9)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=fae58714f590dabb0751e5bc4c2d84eb)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=33e2a0696a103012f5c66fc2b33aa8aa)

1. **Association of Vitamin D Deficiency and Treatment with COVID-19 Incidence.**  
   Meltzer David O. medRxiv : the preprint server for health sciences 2020;:No page numbers.

IMPORTANCEVitamin D treatment has been found to decrease incidence of viral respiratory tract infection, especially in vitamin D deficiency. It is unknown whether COVID-19 incidence is associated with vitamin D deficiency and treatment.OBJECTIVETo examine whether vitamin D deficiency and treatment are associated with testing positive for COVID-19.DESIGNRetrospective cohort study Setting: University of Chicago Medicine Participants: Patients tested for COVID-19 from 3/3/2020-4/10/2020. Vitamin D deficiency was defined by the most recent 25-hydroxycholecalciferol <20ng/ml or 1,25-dihydroxycholecalciferol <18pg/ml within 1 year before COVID-19 testing. Treatment was defined by the most recent vitamin D type and dose, and treatment changes between the time of the most recent vitamin D level and time of COVID-19 testing. Vitamin D deficiency and treatment changes were combined to categorize vitamin D status at the time of COVID-19 testing as likely deficient(last-level-deficient/treatment-not-increased), likely sufficient(last-level-not-deficient/treatment-not-decreased), or uncertain deficiency(last-level-deficient/treatment-increased or last-level-not-deficient/treatment-decreased). Main Outcomes and Measures: The main outcome was testing positive for COVID-19. Multivariable analysis tested whether the most recent vitamin D level and treatment changes after that level were associated with testing positive for COVID-19 controlling for demographic and comorbidity indicators. Bivariate analyses of associations of treatment with vitamin D deficiency and COVID-19 were performed.RESULTSAmong 4,314 patients tested for COVID-19, 499 had a vitamin D level in the year before testing. Vitamin D status at the time of COVID-19 testing was categorized as likely deficient for 127(25%) patients, likely sufficient for 291(58%) patients, and uncertain for 81(16%) patients. In multivariate analysis, testing positive for COVID-19 was associated with increasing age(RR(age<50)=1.05,p<0.021;RR(age≥50)=1.02,p<0.064)), non-white race(RR=2.54,p<0.01) and being likely vitamin D deficient (deficient/treatment-not-increased:RR=1.77,p<0.02) as compared to likely vitamin D sufficient(not-deficient/treatment-not-decreased), with predicted COVID-19 rates in the vitamin D deficient group of 21.6%(95%CI[14.0%-29.2%] ) versus 12.2%(95%CI[8.9%-15.4%]) in the vitamin D sufficient group. Vitamin D deficiency declined with increasing vitamin D dose, especially of vitamin D3. Vitamin D dose was not significantly associated with testing positive for COVID-19.CONCLUSIONS AND RELEVANCEVitamin D deficiency that is not sufficiently treated is associated with COVID-19 risk. Testing and treatment for vitamin D deficiency to address COVID-19 warrant aggressive pursuit and study.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=14ca1dc8d52c558b8252701938efb054)

1. **The role of vitamin D in the prevention of coronavirus disease 2019 infection and mortality.**  
   Ilie Petre Cristian Aging clinical and experimental research 2020;:No page numbers.

WHO declared SARS-CoV-2 a global pandemic. The present aim was to propose an hypothesis that there is a potential association between mean levels of vitamin D in various countries with cases and mortality caused by COVID-19. The mean levels of vitamin D for 20 European countries and morbidity and mortality caused by COVID-19 were acquired. Negative correlations between mean levels of vitamin D (average 56 mmol/L, STDEV 10.61) in each country and the number of COVID-19 cases/1 M (mean 295.95, STDEV 298.7, and mortality/1 M (mean 5.96, STDEV 15.13) were observed. Vitamin D levels are severely low in the aging population especially in Spain, Italy and Switzerland. This is also the most vulnerable group of the population in relation to COVID-19. It should be advisable to perform dedicated studies about vitamin D levels in COVID-19 patients with different degrees of disease severity.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=387055206e04b9c25c32807d22a7011e)

1. **Vitamin D and SARS-CoV-2 virus/COVID-19 disease**  
   BMJ Nutrition, Prevention and Health 2020;: bmjnph-2020-000089 .

This short original report aims to provide a balanced scientific view on vitamin D and SARS-CoV-2 virus/COVID-19 disease. It provides a succinct summary of the current scientific evidence of associations between vitamin D, influenza, upper respiratory tract infections (URTIs) and immune health.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=9b02d0d0a141ee5c4d6c5e8d9b2a71f4)

1. **Vitamin D concentrations and COVID-19 infection in UK Biobank.**  
   Hastie Claire E. Diabetes & metabolic syndrome 2020;14(4):561-565.

BACKGROUND AND AIMSCOVID-19 and low levels of vitamin D appear to disproportionately affect black and minority ethnic individuals. We aimed to establish whether blood 25-hydroxyvitamin D (25(OH)D) concentration was associated with COVID-19 risk, and whether it explained the higher incidence of COVID-19 in black and South Asian people.METHODSUK Biobank recruited 502,624 participants aged 37-73 years between 2006 and 2010. Baseline exposure data, including 25(OH)D concentration and ethnicity, were linked to COVID-19 test results. Univariable and multivariable logistic regression analyses were performed for the association between 25(OH)D and confirmed COVID-19, and the association between ethnicity and both 25(OH)D and COVID-19.RESULTSComplete data were available for 348,598 UK Biobank participants. Of these, 449 had confirmed COVID-19 infection. Vitamin D was associated with COVID-19 infection univariably (OR = 0.99; 95% CI 0.99-0.999; p = 0.013), but not after adjustment for confounders (OR = 1.00; 95% CI = 0.998-1.01; p = 0.208). Ethnicity was associated with COVID-19 infection univariably (blacks versus whites OR = 5.32, 95% CI = 3.68-7.70, p-value<0.001; South Asians versus whites OR = 2.65, 95% CI = 1.65-4.25, p-value<0.001). Adjustment for 25(OH)D concentration made little difference to the magnitude of the association.CONCLUSIONSOur findings do not support a potential link between vitamin D concentrations and risk of COVID-19 infection, nor that vitamin D concentration may explain ethnic differences in COVID-19 infection.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=4c539bf0f9d5327ee84d184993b3f65c)

### Opening Internet Links

The links to internet sites in this document are 'live' and can be opened by holding down the CTRL key on your keyboard while clicking on the web address with your mouse

### Full text papers

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You can then access the papers by simply entering your username and password. If you do not have easy access to the internet to gain access, please let us know and we can download the papers for you.

### Guidance on searching within online documents

Links are provided to the full text of each document. Relevant extracts have been copied and pasted into these results. Rather than browse through lengthy documents, you can search for specific words as follows:

**Portable Document Format / pdf / Adobe**  
Click on the Search button (illustrated with binoculars). This will open up a search window. Type in the term you need to find and links to all of the references to that term within the document will be displayed in the window. You can jump to each reference by clicking it.

**Word documents**  
Select Edit from the menu, the Find and type in your term in the search box which is presented. The search function will locate the first use of the term in the document. By pressing 'next' you will jump to further references.

## C. Search History

|  | **Source** | **Criteria** | **Results** |
| --- | --- | --- | --- |
| 1. | Medline | ("Vitamin D\*" OR "vit d\*" OR colecalciferol).ti,ab | 67770 |
| 2. | Medline | exp "VITAMIN D"/ | 58552 |
| 3. | Medline | (1 OR 2) | 86119 |
| 4. | Medline | exp CORONAVIRUS/ | 16153 |
| 5. | Medline | exp "CORONAVIRUS INFECTIONS"/ | 15312 |
| 6. | Medline | (coronavirus OR "corona virus" OR covid19 OR covid-19 OR wuhan OR hubei OR "novel coronavirus" OR "2019-nCoV" OR "SARS-Cov").ti,ab | 36025 |
| 7. | Medline | (4 OR 5 OR 6) | 43785 |
| 8. | Medline | (3 AND 7) | 64 |
| 9. | PubMed | ("Vitamin D\*" OR "vit d\*" OR colecalciferol).ti,ab | 84599 |
| 10. | PubMed | (coronavirus OR "corona virus" OR covid19 OR covid-19 OR wuhan OR hubei OR "novel coronavirus" OR "2019-nCoV" OR "SARS-Cov").ti,ab | 136633 |
| 11. | PubMed | (9 AND 10) | 220 |
| 12. | PubMed | ((Evidence that Vitamin D Supplementation Could Reduce Risk of Influenza AND COVID-19 Infections) AND Deaths).ti,ab | 3 |
| 13. | EMBASE | ("Vitamin D??" OR "vit d??" OR colecalciferol).ti,ab | 99394 |
| 14. | EMBASE | exp "VITAMIN D"/ | 140761 |
| 15. | EMBASE | exp CORONAVIRUS/ | 14519 |
| 16. | EMBASE | exp "CORONAVIRUS INFECTIONS"/ | 14239 |
| 17. | EMBASE | (coronavirus OR "corona virus" OR covid19 OR covid-19 OR wuhan OR hubei OR "novel coronavirus" OR "2019-nCoV" OR "SARS-Cov").ti,ab | 36440 |
| 18. | EMBASE | (13 OR 14) | 157136 |
| 19. | EMBASE | exp CORONAVIRUS/ | 14519 |
| 20. | EMBASE | exp "CORONAVIRUS INFECTIONS"/ | 14239 |
| 21. | EMBASE | (coronavirus OR "corona virus" OR covid19 OR covid-19 OR wuhan OR hubei OR "novel coronavirus" OR "2019-nCoV" OR "SARS-Cov").ti,ab | 36440 |
| 22. | EMBASE | (19 OR 20 OR 21) | 47136 |
| 23. | EMBASE | (15 OR 16 OR 17) | 47136 |
| 24. | EMBASE | (13 OR 14) AND (15 OR 16 OR 17) | 104 |

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