

Higher Doses of Vitamin D Linked to Lower Suicide Attempts in US Veterans, Study Flags

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A retrospective cohort study of US veterans has found that higher doses of vitamin D supplementation reduced suicide attempts and intentional self-harm by up to 48%. Published in *Plos One*, the research identified the decreased risk as most significant in Black veterans with low blood serum levels.

Vitamin D deficiency is widespread in the US, with more than 30% of military members displaying 25-hydroxyvitamin D levels below 20 ng per mL. The deficiency is particularly prevalent among male service members, where suicide rates are also high.

The research findings hold much promise for vitamin D as a safe, accessible and affordable medication for the veterans in the Department of Veterans Affairs (VA) Center of Excellence for Suicide Prevention once confirmed in clinical trials.

“Although we attempt to control for some characteristics likely to be associated with vitamin D supplementation and/or suicidal and self-harm behaviors, there are many unobservable characteristics (for example, traumatic brain injury common among veterans) that could confound our results,” the researchers explain.

“Our findings should therefore be interpreted as associations rather than causal effects. Concerning generalizability, the VA is primarily male and middle-aged, so our associations may not be generalizable to other populations.”

Effects of vitamin D serum levels

A growing body of evidence has identified associations between suicidal behavior, depressive symptoms and low levels of serum 25-hydroxyvitamin D, according to the research titled: “The association between vitamin D serum levels, supplementation, and suicide attempts and intentional self-harm.”

In a case-control study of 495 service members who had been deployed and later died by suicide, those with seasonally-adjusted vitamin D serum levels less than 15.5 ng per mL had the highest risk of a suicide attempt.

In a study of 157,211 healthy Korean veterans, those with serum levels below 10ng/mL were significantly more likely to experience suicidal ideation. Vitamin D deficiency has previously been associated with symptoms similar to depression, including fatigue, mood changes (e.g., hopelessness and sadness), suicidal thoughts, anxiety, changes in appetite and weight, insomnia and forgetfulness.



Low vitamin D serum levels are associated with various mental and physical disorders.

According to the researchers: “Several limitations may affect the internal validity and generalizability of our study. While many disabled veterans and those with very high medication costs receive free care from the VA, including non-prescription products.”

They further explain that for many veterans, the cost of vitamin D products may be the same or lower when purchased through retail outlets. “Therefore, we suspect some of our untreated sample, especially those with vitamin D deficiency, received over-the-counter supplementation.”

“However, unobserved supplementation in the control group would make our estimates of decreased suicide attempt risk conservative. Another limitation is that patients filling prescriptions for vitamin D may engage in other health and mental health-improving behaviors that we do not observe.”

In addition, low vitamin D serum levels have been associated with other mental and physical disorders with high rates of comorbid depression, including obesity, schizophrenia and seasonal affective disorder.

Serum vitamin D is derived from skin exposure to the sun or dietary vitamin D, including supplements D2 and D3. Serum vitamin D supports bone health, immune function, and absorption of other micronutrients.

As vitamin D levels were increased, the proportion of veterans experiencing suicide attempts and self-harm declined in the control groups and stayed relatively fixed in the treated groups.

In related news, a DSM white paper demonstrates that supplementing with calcifediol rapidly increases vitamin D reducing the time needed to achieve “optimized blood 25(OH)D levels from several months to weeks.

Key findings



Serum vitamin D is derived from skin exposure to the sun.

In the vitamin D2 sample, a total of 338,482 veterans were identified – divided equally between control and treatment groups – with a 0.52% unadjusted suicide attempt and self-harm rate in controls and a 0.27% rate amongst the treated. In the vitamin D3 sample, 981,770 veterans were identified – also equally divided.

Suicide attempt and self-harm rates by gender and race were similar to the samples for both vitamin D2 and D3 subsamples. However, the serum level subsamples in both vitamin D2 and D3 demonstrated notably lower attempt and self-harm rates than in the whole sample. Those who have their vitamin D levels tested are likely characteristically different from those that did not receive testing.

A potential mechanism of action for vitamin D serum levels and suicide was found in a study of the post-mortem brain tissue from 15 depressed suicide decedents matched by age, sex, and death interval to 15 non-psychiatric controls.

An increased vitamin D receptor gene expression and decreased cathelicidin-related antimicrobial peptide expression were identified in the suicide decedents but not the matched

controls. Randomized controlled trials of vitamin D supplementation and psychiatric outcomes have produced conflicting results, with trials reporting both positive and null or negative effects.

Controlled and treated veterans

Veterans taking vitamin D3 (cholecalciferol) or vitamin D2 (ergocalciferol) between 2010 and 2018 were matched 1:1 with untreated control veterans having similar demographics and medical histories.

Cox proportional hazards regression – a method for investigating the effect of several variables upon the time a specified event takes to happen – was used to estimate the time from the first vitamin D3 (cholecalciferol) or vitamin D2 (ergocalciferol) prescription to the first suicide attempt or intentional self-harm.

Analyses were repeated in stratified samples to measure demographic associations by race (Black or White), gender (male or female), blood levels and the average daily dosage.

Lastly, mental health comorbidities previously associated with suicide attempts were also analyzed, such as major depressive disorder, mood disorder, schizophrenia, bipolar disorder, substance use disorder, post-traumatic stress disorder and personality disorder.