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Take Control of Your Health

This Nutrient Deficiency Is Associated With Depression

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STORY AT-A-GLANCE -

- A study published in the British Journal of Nutrition found an association between vitamin B12 deficiency and the incidence of depression in older people living in the community
- Older adults with low levels had a 51% increased risk of developing depression during the study. Low levels of vitamin B12 may result from poor diet, or poor absorption related to lower levels of pepsin secretion that releases vitamin B12 from food
- Other nutrient deficiencies are also associated with depression, including vitamin D and a low omega-3 index. Vitamin D deficiency may result from limited exposure to sunlight, inadequate absorption or poor conversion to the active form
- Omega-3 fatty acids are essential for brain health, blood clotting, muscle activity and more. The omega-3 index is lowest in North America, Europe, Central and South America, Africa and the Middle East. Deficiency contributes to mood disorders, including depression

Research published in December 2021[1] using data from the Irish Longitudinal Study on Aging (TILDA) discovered those with a vitamin B12 deficiency had a greater risk of symptoms of depression. According to the Anxiety and Depression Association of America,[2] 264 million people worldwide live with symptoms of depression. In 2017, roughly 17.3 million adults in the U.S. had experienced at least one major depressive episode.

This number rose in 2019 to 19.4 million adults who had experienced at least one major depressive episode.[3] It is not uncommon for someone who has depression to also suffer from symptoms of anxiety.[4] According to the CDC,[5] data from the National Health and Nutrition Examination Survey show women are roughly twice as likely to experience depression as men, which was a pattern that was observed in each age group surveyed.

Symptoms of depression can include feeling sad or empty, hopeless, irritable, worthless and restless. You may have difficulty sleeping, experience appetite or weight changes or have thoughts of death or suicide. Not everyone experiences every symptom. For some individuals, their symptoms make it difficult to function.[6]

The December 2021 study linked deficiencies in vitamin B12 with the incidence of symptoms of depression in the elderly. Vitamin B12 is a water-soluble vitamin found in some foods.[7] It's also available as a prescription medication and dietary supplement. Your body uses vitamin B12 for the function and myelination of the central nervous system, to form healthy red blood cells and in DNA synthesis.

Food sources include those of animal origin, such as pasture-raised poultry, dairy products, eggs and meat. Absorption of vitamin B12 is dependent on intrinsic factor, which is a transport and delivery binding protein produced in the stomach.[8] The bioavailability from food decreases when the amount of vitamin B12 exceeds the capacity of intrinsic factor.

Vitamin B12 is released from food by the activity of hydrochloric acid and gastric protease in the stomach and saliva in the mouth.[9] In 1999 it was estimated[10] that vitamin B12 deficiency affects up to 15% of people over age 60. In this study, however, classic symptoms of deficiency were often lacking in this population.

The low vitamin B status is attributed to the high prevalence of atrophic gastritis which results in low-acid pepsin secretion and reduces the release of vitamin B12 from food. The 2021 study finds these low levels of vitamin B12 may increase the risk of depression in older adults.[11]

Vitamin B12 Deficiency Associated With Depression

The study published in the British Journal of Nutrition[12] sought to evaluate the relationship between vitamin B12, folate and the incidence of depression in older individuals living in the community. There were 3,849 individuals over age 50 included.

The results showed a link between vitamin B12 deficiency, but not with a folate deficiency.[13] The researchers found that even after controlling for factors such as chronic disease, cardiovascular disease, antidepressant use, physical activity and vitamin D status, the results remain significant.[14]

The older adults who had a B12 deficiency had a 51% increased risk of developing symptoms of depression during the four years of the study. The data also showed that certain factors influenced the vitamin B12 status in older adults. This included geographic location, obesity, smoking, socioeconomic status and gender.

While the link was found between older adults living in the community and a vitamin B12 deficiency, they also found that older individuals in the study had a lower risk of depression. In a press release from Trinity College Dublin, Eamon Laird, from TILDA[15] and lead scientist of the study talked about the results in a press release, saying:[16]

> *"This study is highly relevant given the high prevalence of incident depression in older adults living in Ireland, and especially following evidence to show that one in eight older adults report high levels of low B12 deficiency rates.*
>
> *There is a growing momentum to introduce a mandatory food fortification policy of B-vitamins in Europe and the UK, especially since mandatory food fortification with folic acid in the US has showed positive results, with folate deficiency or low status rates of just 1.2% in those aged 60 years and older."*

Vitamin D Deficiency Plays a Role in Mental Health

This recent study highlights the importance of adequate nutrition to protect your optimal health. In addition to vitamin B12, other nutrients have a significant effect on

mental health. Vitamin D is one of those nutrients. Vitamin D, also known as calciferol,[17] is a fat-soluble vitamin, which your body can absorb from a few foods and produces endogenously when exposed to sunlight.

People can become deficient when they consume less than the recommended level, have limited exposure to sunlight, their absorption from the digestive tract is inadequate, or the kidneys do not convert the vitamin to its active form. Scientists believe that vitamin D deficiency is a vastly overlooked global health problem at epidemic proportions.[18]

How vitamin D deficiency is defined also varies. For the most part, researchers interpret vitamin D deficiency as serum levels of 25(OH)D at 20 nanograms per milliliter (ng/mL) or less.[19] However, optimal serum levels of vitamin D are between 40 ng/mL and 60 ng/mL.[20]

Early research in 2000[21] demonstrated there were significantly deficient levels of vitamin D3 in patients who suffered from depression and alcohol addiction. By 2007, researchers had recognized the importance of low levels of vitamin D on mood.[22]

Further research[23] found individuals with fibromyalgia also had a higher risk of low serum levels of vitamin D and it appeared that supplementing with high doses of vitamin D in individuals who were depressed and overweight could ameliorate the symptoms.[24] Over the years, researchers continue to ask the question if vitamin D is a causal association with depression or another symptom of the condition.[25]

Other scientists postulated whether an effective therapy for depression would be the detection and treatment of vitamin D deficiency.[26] By 2014,[27] one study found hypovitaminosis D was associated with the severity of depression that people experienced. Their results suggested there was an inverse associated dose-response, which implied that low levels of vitamin D may be an underlying biological vulnerability.

In 2018,[28] the British Journal of Psychiatry published a systematic review and meta-analysis that demonstrated low levels of vitamin D are associated with depression. The important factor to remember is that it's highly unlikely supplementation in people

whose serum levels are optimal will have any effect on mood disorders. Instead, the effect is more likely to be found in those whose serum levels are low.

Relevance of Omega-3 Fatty Acids for Depression

Omega-3 fats are essential polyunsaturated fatty acids (PUFAs), which your body needs for a variety of functions. These include digestion, blood clotting, brain health and muscle activity. In early 2021, omega-3 fats made the news when data[29] revealed individuals with an omega-3 index measuring 5.7% or greater had significantly better outcomes from COVID-19.

An omega-3 index measures the amount on the red blood cell membranes.[30] Those with a measurement less than 4% have a higher risk of heart disease. Individuals with an omega index between 4% and 8% have an intermediate risk and those whose level is greater than 8% are at low risk of heart disease.

One 2016 published analysis of the data[31] revealed there were areas of the world with omega-3 index measurements greater than 8%. These included Scandinavia, Sea of Japan and indigenous populations who did not eat westernized foods. Areas of the world with levels below 4% included Central and South America, Europe, North America, the Middle East, Southeast Asia and Africa.

While your level of omega-3 is important, equally as important is the ratio between omega-6 and omega-3. I have found it extremely difficult to correct an imbalance by simply taking more omega-3 fats. In fact, just as an excessive amount of omega-6 is dangerous, an excessive amount of omega-3 can also contribute to ill-health.

The imbalance between omega 6 and omega 3 that occurred in the last 150 years is thought to be behind many of the inflammatory-related diseases common in society, including depressive disorders.[32] Increasing evidence suggests that a deficiency in omega-3 fats contribute to mood disorders, including depression.[33,34,35]

Increased Risk in Elderly of Deficiencies and Depression

Vitamin D,[36] B12[37] and omega-3 fats are common deficiencies found in the general population and older adults. The reason older adults may have nutrient deficiencies is likely related to poor absorption, poor diet and lack of exposure to sunlight.

A lack of optimal levels of nutrients is a significant contributor to the development of inflammation and disease, and one of the health conditions associated with inflammation is depression.[38] Depression affects the quality of life and productivity in the elderly, at a time when they are often more isolated from others.

To date, many older adults are treated for depression using psychotherapy and/or medications. However, since there is a significant link between nutrition and mood, it only makes sense to first address the potential nutrient deficiencies before adding medications that come with a long list of side effects.

One of the more common classes of antidepressants, selective serotonin reuptake inhibitors (SSRIs),[39] may trigger nausea, dizziness, insomnia, anxiety, diarrhea and tremors,[40] all of which can be dangerous for older adults. These side effects can negatively impact intake or increase the risk of a fall.

As has been demonstrated during the COVID-19 pandemic, maintaining optimal health and nutrition helps to reduce your risk of contracting a viral illness. The featured study also demonstrates that nutrient intake is crucial to your mental health. It is much easier to address bodily needs before they trigger illness and disease. Although it may take a little time and energy, it is vital for your quality of life to take control of your health.

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