

# Three Potent Contributors to Depression and Anxiety You Should Know About

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## STORY AT-A-GLANCE

- › An estimated 500,000 American teens struggle with depression, and more than three-quarters of them are girls. Nearly twice as many adult women also use psychiatric drugs than men
- › Mindfulness training may be helpful to combat the overstimulation and influence of social media. Other factors that need to be addressed if you are depressed include your diet and sun exposure
- › Research suggests increasing consumption of fresh fruits and vegetables may improve your mental wellbeing in as little as two weeks

***Editor's Note: This article is a reprint. It was originally published March 2, 2017.***

Studies show that the number of teens experiencing depression has spiked since 2011, and teenage girls are more prone to depression than boys at this age. The researchers suggest social media may be part of the problem.

Analyzing federal data from 2005 to 2014 revealed an estimated 500,000 American teens struggle with depression, and more than three-quarters of them are girls. The gender trend appears to continue in older age as nearly twice as many adult women also use psychiatric drugs than men (21% and 12% respectively).<sup>1,2</sup> As reported by NPR:<sup>3</sup>

*"The findings are just the latest in a steady stream of research showing that women of all ages experience higher rates of depression compared to men, says psychologist and author Catherine Steiner-Adair.*

*And no wonder, she says – despite gains in employment, education and salary, women and girls are still 'continually bombarded by media messages, dominant culture, humor and even political figures about how they look – no matter how smart, gifted or passionate they are.'*

*Today's constant online connections – via texting, Facebook, Instagram and Snapchat, – can exacerbate that harsh focus on looks and other judgments from peers ..."*

Mental disorders are also the second most common cause of disability among Americans of both sexes, having risen sharply since 1980.<sup>4</sup> What can be done to turn this destructive tide?

Steiner-Adair suggests mindfulness training can be helpful to combat the overstimulation and influence of social media. Other factors that should not be overlooked include your diet and sun exposure.

## **Diet and Mental Health**

Research shows your diet can have a profound effect on your mental health.<sup>5,6</sup>

Gastrointestinal abnormalities have been linked to a variety of psychological problems, including depression, anxiety, hyperactivity and schizophrenia.

Part of the explanation for this relates to the fact that you have, in a very real sense, not one but two brains – one in your head and one in your gut – connected via your vagus nerve, which runs from your brain stem to your abdomen.

It is now well established that the vagus nerve is the primary route your gut bacteria use to transmit information to your brain,<sup>7</sup> which helps explain why mental health can be so intricately connected to your gut microbiome.<sup>8</sup>

For example, fermented foods have been shown to curb social anxiety disorder in young adults,<sup>9,10</sup> and animal research found obsessive-compulsive repetitive behaviors were pacified by introducing a strain of the bacterium *Bacteroides fragilis*.<sup>11</sup> Molecules traveling via your immune system can also influence your brain's function.<sup>12</sup>

## **Bacteria Produce Mood-Boosting Brain Chemicals**

Gut bacteria actually produce mood-boosting neurotransmitters. In fact, the greatest concentration of serotonin is found in your intestines, not your brain. However, they likely work locally as intestinally produced neurotransmitters do not pass the blood brain barrier. As noted in a previous New York Times article on this topic:<sup>13</sup>

*"Microorganisms in our gut secrete a profound number of chemicals, and researchers ... have found that among those chemicals are the same substances used by our neurons to communicate and regulate mood, like dopamine, serotonin and gamma-aminobutyric acid (GABA).*

*These, in turn, appear to play a function in intestinal disorders, which coincide with high levels of major depression and anxiety. [In 2014], for example, a group in Norway examined feces from 55 people and found certain bacteria were more likely to be associated with depressive patients."*

What's more, gut microbes can also alter the way in which your central nervous system uses these neurochemicals. In one experiment designed to investigate the influence of microbes on depression, researchers performed fecal transplants, transferring stool samples from human patients into rats.<sup>14</sup>

The rats who received stool from patients diagnosed with depression rapidly began exhibiting signs of depression and anxiety. According to one of the researchers, "Their behavior does quite dramatically change." The rats who received stool from non-depressed individuals had no changes in behavior.

Based on these findings (which were never published), the researchers warn that people who opt for fecal transplants for health reasons would be wise to screen the fecal donor

for a history of mental illness in addition to other transmissible diseases.

## **Healing Your Gut May Ease Your Mental Troubles**

Researchers are increasingly starting to view gut inflammation as the root of depression, and one of the quickest and easiest ways to address this problem is by making the appropriate dietary changes. As a general rule, to cultivate a healthy gut flora through your diet:

- Eat real food and avoid processed foods. According to one 2009 study, a processed food diet may increase your risk of depression by as much as 60%, whereas a whole food diet is protective.<sup>15,16</sup>

Be particularly vigilant about avoiding refined sugars (especially processed fructose), dairy and gluten. Other processed food ingredients that promote depression are:

- Genetically engineered ingredients, as they have been shown to significantly alter your gut flora by promoting pathogens and decimating beneficial microbes.
  - Nonorganic, industrially produced food loaded with glyphosate, which has been shown to cause nutritional deficiencies, especially minerals, critical for brain function and mood control. Glyphosate can also destroy cellular tight junctions and change the permeability of the blood brain barrier, allowing substances to enter the brain that were never designed to.
  - Artificial food additives, especially the artificial sweetener aspartame, can wreak havoc with your brain function. Both depression and panic attacks are known potential side effects of aspartame consumption. Other additives, such as artificial colorings, are also known to impact mood.
- Eat traditionally fermented and cultured foods each day; the more variety the better.

- Eat plenty of fiber, found in most fruits and vegetables, especially leafy greens, flax, hemp and chia seeds, berries, broccoli, cauliflower and **Brussel sprouts**, root vegetables, peas and beans, as well as prebiotic foods<sup>17</sup> (foods that feed probiotics or healthy bacteria) such as garlic, leeks, onion, dandelion greens and asparagus.

Prebiotics are indigestible food ingredients that provide no nutrition per se. Their purpose is to nourish the friendly bacteria inside your GI tract.

- Boost consumption of healthy fats, such as **avocados**, MCT oil, coconuts and coconut oil, butter and pastured egg yolks.
- Normalize your omega-3 to omega-6 ratio by increasing animal-based omega-3 from fish (good options include wild Alaskan salmon, sardines and **anchovies**) and/or krill oil, and reduce omega-6 by avoiding processed foods and vegetable oils. An ideal ratio is about 1:1. Although omega-3s are most well known for their role in heart health, they also play an integral role in brain health and mental health.

Also avoid the following, which are known to harm your gut microbiome:

- Antibiotics
- Chlorinated water
- Antibacterial soap
- Agricultural chemicals
- Pollution

## **Increasing Vegetable Consumption May Quickly Improve Mental Well-Being**

Most recently, researchers in New Zealand found increasing consumption of fresh fruits and vegetables may improve your mental wellbeing in as little as two weeks. According to Medical News Today:<sup>18</sup> "[Y]oung adults who were given extra fruits and vegetables each day for 14 days ate more of the produce and experienced a boost in motivation and vitality."

American dietary guidelines suggest eating two cups of fruit and two to three cups of vegetables daily, but many fail to get even a fraction of this amount. In this study, the treatment group received two additional servings of fresh fruits and vegetables, including carrots, kiwi, apples and oranges each day for two weeks, while the control group continued their normal diet.

Those who ate the most fruits and vegetables, averaging 3.7 servings per day, experienced the most pronounced improvements in psychological well-being, especially improvements in "vitality, motivation and flourishing." According to the authors, "Findings provide initial validation of a causal relationship between [fruits and vegetables] and well-being, suggesting that large-scale intervention studies are warranted."

## **Sunlight and Vitamin D Also Affect Your Mental Health**

Besides diet, sunlight also has a profound impact on your mental health – more so than any other weather phenomenon. That was the conclusion of a study looking at links between weather and depression in a group of students.<sup>19</sup> It's been estimated<sup>20</sup> that as many as 20% of Americans are affected by Seasonal Affective Disorder (SAD) each winter, suffering from the blues, fatigue and in some cases, more serious depression, as sunlight grows scarce.

What differentiates SAD from regular depression is that a full remission occurs in the spring and summer months. Indeed, as the days got shorter through fall and winter, self-reports of depression rose, whether the student had been diagnosed with SAD or not. According to the authors:

*"These findings suggest the need for institutions and public health entities to plan for intervention and prevention resources and strategies during periods of reduced sun time."*

The researchers note that more research is needed to evaluate related factors such as vitamin D intake, amount of time actually spent outdoors and sunbed use. Indeed, vitamin D deficiency is strongly associated with a higher risk of depression.

For example, research has shown having a vitamin D level below 20 nanograms per milliliter (ng/mL) can raise your risk for depression by as much as 85%, compared to having a vitamin D level greater than 30 ng/mL. A number of studies have also confirmed that adequate levels of vitamin D can help alleviate symptoms of depression.<sup>21</sup>

One of the mechanisms is thought to be vitamin D's anti-inflammatory properties, which again hints at inflammation being a root cause of depression.

A study published in 2015,<sup>22</sup> which looked at healthy women aged 18 to 25 who lived in the Pacific Northwest during the fall, winter and spring, found that vitamin D insufficiency (30 ng/ml or lower) could predict the emergence of clinically significant depressive symptoms. The link remained even after controlling for factors such as season, body mass index, race, diet, exercise and time spent outdoors.

## **How Sunlight Can Influence Your Mood**

Vitamin D cannot account for all of the mental health benefits associated with sunlight, though. According to a paper published in the journal *Dermato-Endocrinology*,<sup>23</sup> a large number of light-absorbing molecules (chromophores) found in the different layers of your skin absorb and interact with ultraviolet rays, producing a number of complex and synergistic effects.

I am strongly convinced this benefit is not just from UVB exposure that generates vitamin D but also red, near-, mid- and far-infrared light. The intensity of the light is also a large factor as it is far brighter outside than indoors. There are additional chromophores in your mitochondria electron transport chain that respond to near-infrared.

This complex stimulus of sunlight affects not only your physical health by preventing diseases, it also impacts your mood and mental health. For example:

- Your body uses the near-infrared light spectrum to produce mitochondrial energy and maintain systemic equilibrium. Knowing this, it seems reasonable to conclude

that if you're running low on adenosine triphosphate (ATP) – cellular energy – due to insufficient amounts of sunlight exposure, you'd start feeling sluggish and tired, and possibly depressed.

- Sunlight also regulates your circadian rhythm, and light therapy has been shown to be effective against both SAD and non-seasonal major depression. When it's dark, your melatonin levels increase, which is why you may feel tired when the sun starts to set. In the heart of winter, this may be at as early as 4 p.m.
- Ultraviolet (UV) light also stimulates epidermal cells known as keratinocytes to make beta-endorphins, which have a mood-boosting effect.
- Serotonin is also released in response to sunlight, which helps elevate your mood and energy.
- UVA generates nitric oxide (NO) in your skin, which influences your body in a number of beneficial ways. It stimulates up to 60% of your blood to flow to your skin capillaries where the blood absorbs UV and infrared radiation, which can structure water in your body.

Additionally, the UVA actually helps kill any infections in your blood while the infrared recharges your cellular battery. NO also lowers inflammation, which could have a beneficial impact on your mental health seeing how depression is strongly linked to chronic, low-grade inflammation.

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