

BMJ NUTRITION PREVENTION & HEALTH

Peer reviewed? Yes

Evidence type: Evidence review

Subjects: People

Probiotics alone or combined with prebiotics may help ease depression

But possible contribution to lessening anxiety not yet clear, evidence review suggests

Probiotics either taken by themselves or when combined with prebiotics, may help to ease depression, suggests a review of the available evidence, published in **BMJ Nutrition Prevention & Health**.

But as to whether they might help to lessen anxiety isn't yet clear, say the researchers.

Foods that broaden the profile of helpful bacteria in the gut are collectively known as probiotics, while prebiotics are compounds that help these bacteria to flourish.

In the UK in 2016-17, 1.4 million people were referred with mental health issues, over half of them (53%) had anxiety or stress related disorders, while a third (33%) had depression.

A two-way relationship exists between the brain and digestive tract, known as the gut-brain axis. And the possibility that the microbiome--the range and number of bacteria resident in the gut--might help treat mental ill health has become a focus of interest in recent years.

To explore this further, the researchers searched for relevant studies published in English between 2003 and 2019, which looked at the potential therapeutic contribution of pre-and probiotics in adults with depression and/or anxiety disorders.

Out of an initial haul of 71 studies, just 7 met all the criteria for inclusion. All 7 investigated at least 1 probiotic strain; 4 looked at the effect of combinations of multiple strains.

In all, 12 probiotic strains featured in the selected studies, primarily *Lactobacillus acidophilus*, *Lactobacillus casei*, and *Bifidobacterium bifidum*. One study looked at combined pre-probiotic treatment, while one looked at prebiotic therapy by itself.

The studies varied considerably in their design, methods used, and clinical considerations, but all of them concluded that probiotic supplements either alone or in combination with prebiotics may be linked to measurable reductions in depression.

And every study showed a significant fall or improvement in anxiety symptoms and/or clinically relevant changes in biochemical measures of anxiety and/or depression with probiotic or combined pre-probiotic use.

Of the 12 different probiotics investigated, 11 were potentially useful, the findings showed.

The researchers highlight several caveats to their review: none of the included studies lasted very long; and the number of participants in each was small.

This makes it difficult to draw any firm conclusions about the overall effects, whether they are long lasting, and whether there might be any unwanted side effects associated with prolonged use, they say.

Nevertheless on the basis of the preliminary evidence to date, pre- and probiotic therapy warrant further investigation, they suggest.

Probiotics may help reduce the production of inflammatory chemicals, such as cytokines, as is the case in inflammatory bowel disease, suggest the researchers. Or they may help direct the action of tryptophan, a chemical thought to be important in the gut-brain axis in psychiatric disorders.

As anxiety disorders and depression affect people very differently, they require treatment approaches that take account of these complexities, they say. "In this way, with a better understanding of the mechanisms, probiotics may prove to be a useful tool across a wide range of conditions," they write.

People with depression and/or anxiety disorders also often have other underlying conditions, such as impaired insulin production and irritable bowel syndrome, they point out.

"As such, the effect that probiotics have on patients with [common mental disorders] may be twofold: they may directly improve depression in line with the observed findings of this review, and/or they might beneficially impact a patient's experience of their [common mental disorder] by alleviating additional comorbidities," they write.

"Purely from the information gathered for this review, it is valid to suggest that, for patients with clinically recognised depression: isolate, or adjuvant prebiotic therapy is unlikely to affect an individual's experience of their condition in a quantitatively evident way; and that isolate or adjuvant, probiotic/combined prebiotic-probiotic therapy may offer a quantitatively measurable improvement in parameters relating to depression," they conclude.

"However, there are inadequate data to suggest anything meaningful to support or refute the use of either pre/probiotic agents (or a combination of both) in patients with clinically recognised anxiety disorders; this would be a useful area to investigate further."