

Effect of Probiotics on Depression: A Systematic Review

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Structured Abstract

Background: Depression is a globally prevalent mental health disorder with significant cognitive deficits. Treatments by psychotherapy and antidepressant often fail to address the cognitive impairments. In recent years, the manipulation of gut microbiota-brain axis has emerged as a promising target for the treatment of this neuropsychiatric condition. Probiotic supplements have been suggested as a strategy to modulate the gut microbiome, and concurrently improve the communication of the gut and the brain in order to alleviate depressive symptoms and improve cognitive functions. Although preliminary studies show promising result, the acceptance of probiotics intervention remains as an ongoing debate in the healthcare field. This study aims to provide a comprehensive review of the effects of probiotics on depression, focusing on changes in gut microbial composition and neural mechanisms.

Methods: Research from the past decade is analysed in order to determine the efficacy of probiotic supplementation in reducing depressive symptoms and explore associated changes in the gut-brain communication. The methodology involves inclusion and exclusion criteria searched on keywords in Pubmed database from 10 years back until November 2023. The inclusion criteria include randomized controlled trial (RCT) that are grouped into probiotic and placebo, and use established scientific rating scales for assessment. Exclusion criteria encompass other mental health disorders other than depression, other underlying health conditions like obesity, and incorporating the use of pre- and post-biotics.

Results: Nine of twelve studies consistently demonstrate improved depressive scores, along with enhanced depressive biomarkers as secondary outcomes. These investigations reveal advancements in gut microflora reconstruction, reductions in inflammatory markers, improvements in cognitive function, and enhancements in overall brain health and mood regulation. The hypothesized probiotic mechanism illustrates how probiotics improve depression through the gut-brain axis. The reconstructed gut microflora interacts with the brain via the vagus nerve to elevate the production of GABA, GSH, and serotonin and therefore elucidating their functions in enhancing brain health.

Conclusion: In conclusion, probiotic interventions for depression offers promising avenues for therapeutic exploration. The heterogeneity among the RCT results from the previous papers will inform medical health practitioners to an updated discovery and contribute to a clear understanding of probiotics as a viable treatment option.

Keywords: Beneficial microbes, mental disorder, gut-brain axis

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