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Gut Microbiome Alterations in Aging People and Association with Alzheimer's Disease

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Structured Abstract

Background: The "Gut microbiome" describes the collection of microorganisms that reside in the gastrointestinal tract, including bacteria, viruses, and fungi. Gut microbiota play an important role in human health, including digestion, nutrient production, metabolism, immune system regulation, and protection against pathogens. These microbiomes have been found to undergo age-related modifications among the elderly which is known as dysbiosis, an imbalance in the composition and functionality of the gut microbiome with a decline in beneficial microorganisms and an increase in potentially hazardous microorganisms as its defining characteristics. These alterations can result in the triggering of harmful local and systemic inflammation, impaired immune function, as well as altered metabolism all of which can aid in the onset and advancement of mental diseases such as Alzheimer's Disease (AD).

Methods: This review was done through a compilation of previous studies conducted by other researchers. There is about 58 articles referred to conduct and complete this review.

Results: This review showed an association between gut microbiome and Alzheimer's Disease (AD) through gut-brain axis communication. Data from clinical studies suggest that dysbiosis of the gut microbiota is a major component affecting behaviour and brain function via the microbiota–gut–brain axis, and may lead to AD. A difference in microbiome composition of AD participants was found, in which AD patients are reported to have an increased abundance of *Bacteroidetes* and a decreased abundance of *Firmicutes* and *Bifidobacterium.* There is evidence that AD can be prevented among the elderly through dietary interventions to alter the gut microbiome composition, by increasing the abundance of beneficial bacteria such as *Lactobacillus*, *Bifidobacterium, Faecalibacterium prausnitzii* and *Roseburia.*

Conclusion: The findings of this review indicated that there is an interaction between gut microbiome and Alzheimer's Disease among the elderly through gut-brain axis communication. However, dietary interventions can assist in enhancing mental health by restoring healthy gut microbiome in the elderly.

Keywords: Gut Microbiome, Dysbiosis, Aging, Alzheimer's Disease, Review

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