The association between habitual dietary patterns and the human gut microbiome:

A systematic literature review

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5th November, 2018
Abstract

**Background:** The constitution of the human gut microbiome has been notably linked to both chronic disease states and diet. Dietary patterns therefore have the potential to prevent disease and promote health by sculpting a protective gastrointestinal ecosystem.

**Aim:** To systematically review the evidence for associations between habitual dietary patterns and the human gut microbiome and to identify potential health implications for established links.

**Methods:** A systematic search was conducted across Cochrane Controlled Trials Register, CINAHL, EMBASE, MEDLINE, and PreMEDLINE on September 4th, 2018. Constituent of a broader project, the search strategy included randomised controlled trials, non-randomised clinical trials, cross-sectional, cohort and case control studies examining any aspect of diet and associated gut microbiota changes in adults. Due to the size and divergence of the search outcome, results were further limited to healthy non-pregnant adult participants and habitual non-therapeutic dietary patterns.

**Results:** A total of 19 cross-sectional and non-randomised clinical trials involving 1511 subjects and examining Mediterranean, gluten-free, omnivorous, vegetarian, vegan diets and dietary patterns with differing fat and fibre contents were included. Significant findings, although present in each study, were rarely repeated at the dietary pattern level and were even opposed by contrary or lack of significant findings.

**Conclusions:** Due to incoherency of results, serious risk of bias and poor quality of evidence due to clinical and methodological heterogeneity, no firm conclusions could be made regarding the associations between dietary patterns and the gut microbiome. To explore this link further, studies should adopt more rigorous study designs, controlling for known confounders and use consistent up-to-date dietary and microbial assessment methods.

**Keywords:** Diet, Dietary patterns, Health, Microbiome, Microbiota