

Probiotics and synbiotics in chronic constipation in adults: a systematic review and meta-analysis of randomised controlled trials

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Chronic constipation is a burdensome gastrointestinal disorder that affects 12% of adults⁽¹⁾. It remains challenging to treat, with half of patients reporting dissatisfaction with current treatment options⁽²⁾. Probiotics and synbiotics have been increasingly investigated for their use in the management of constipation. The aim was to investigate the effect of probiotics and synbiotics on stool output, gut transit time (GTT), gastrointestinal symptoms, and quality of life in adults with chronic constipation via a systematic review and meta-analysis of randomised controlled trials (RCTs).

Eligible studies were identified using electronic databases, backward citation and hand-searching abstracts. The search date was 10th July 2022. RCTs with a placebo control reporting administration of probiotics or synbiotics in adults with chronic constipation were included. Risk of bias (RoB) was assessed with the Cochrane RoB 2.0 tool. Meta-analysis was conducted separately for probiotics and synbiotics. Results were synthesised using risk ratios (RR), mean differences (MD) or standardised mean differences (SMD) and 95% confidence intervals (CI) using a random-effects model.

Thirty RCTs (n = 2,804) investigating probiotics and four RCTs (n = 275) investigating synbiotics were included. Overall, probiotics increased stool frequency compared to control (SMD 0.71, 95% CI 0.37, 1.04, p < 0.00001; I²=91%, p < 0.00001). Subgroup analysis showed that *Bifidobacterium lactis* had a significant effect on stool frequency, but not mixtures of probiotics, *Bacillus coagulans* Unique IS2 or *Lactobacillus casei* Shirota. Probiotics did not impact stool consistency compared to control (SMD 0.26, 95% CI -0.03, 0.54, p = 0.08; I²=88%, p < 0.00001). Probiotics did not impact whole GTT compared to control (MD -3.0 h, 95% CI -10.4, 4.4, p = 0.43; I²=54%, p = 0.06). Probiotics improved global symptom scores compared to control (SMD -0.46, 95% CI -0.89, -0.04; I²=89%, p < 0.00001).

Regarding individual symptoms, probiotics reduced the severity of incomplete evacuation (SMD -0.81, 95% CI -1.17, -0.45, p < 0.0001; I²=74%, p = 0.002). The probiotic strain *Bacillus coagulans* Unique IS2 reduced the frequency of abdominal pain (MD -0.67 points, 95% CI -1.14, -0.20, p = 0.005; I²=87%, p = 0.005). Synbiotics had no impact on stool frequency (MD 0.5 bowel movements/week, 95% CI -0.8, 1.9, p = 0.43; I²=87%, p = 0.0006) or consistency (SMD 0.16, 95% CI -0.48, 0.81, p = 0.62; I²=56%, p = 0.10) compared to control.

In conclusion, certain probiotics improve stool frequency and global symptoms, providing cautious optimism for their use as a dietary management option in chronic constipation. The findings provide evidence for the use of *B. lactis* for stool frequency, and *B. coagulans* Unique IS2 for abdominal pain. There is currently insufficient evidence to recommend synbiotics in the management of chronic constipation, and further RCTs are needed to establish their effectiveness. Caution is needed when interpreting these findings due to high heterogeneity and strain-specific effects amongst included studies.

References

1. Sperber AD, Bangdiwala SI, Drossman DA, *et al.* (2021) *Gastroenterology* **160**, 99–114.
2. Johanson J & Kralstein J (2007) *Pharmacol Ther* **25**, 599–608.