

Abstract

# Systematic Review and Meta-Analysis of Chicory Inulin-Type Fructans Supplementation on Weight Management Aspects<sup>†</sup>

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**Abstract:** Maintaining and reducing weight are considered as important features in reducing mortality and morbidity caused by metabolic-associated diseases. Increasing evidence from in vivo mechanistic and clinical studies has shown that the gut microbiota is interacting with the host's physiological function in regulating energy intake and body weight. A prebiotic is a substrate that is selectively utilized by host microorganisms conferring a health benefit. Numerous clinical studies showed multifaceted benefits of prebiotic chicory inulin-type fructans (ITFs) on gut and metabolic health. The present systematic review and meta-analysis aimed to synthesize the totality of evidence through pooled estimates of ITF supplementation in supporting weight management on both healthy and diseased subjects. A systematic search for eligible articles was performed in databases (EMBASE, MEDLINE (PubMed), Web of Science) without a language restriction. Two reviewers independently extracted data from eligible articles. We chose primary (body weight) and secondary (BMI, total fat mass, body fat percentage and waist circumference) outcomes as weight management parameters. The baseline-corrected mean difference (MD) was used to synthesize the pooled effect size by employing a random-effects model using the inverse variance method. A sub-group analysis based on dose, duration, health status and ITF-type was also conducted. A total of 31 randomized controlled trials with 40 arms ( $n = 1309$  participants) were included in this review. A significant reduction was observed on body weight (MD:  $-1.03$  kg, 95% CI:  $-1.42$  to  $-0.64$ ,  $p < 0.0001$ ), BMI (MD:  $-0.39$  kg/m<sup>2</sup>, 95% CI:  $-0.58$  to  $-0.21$ ,  $p = 0.0001$ ), fat mass (MD:  $-0.45$  kg, 95% CI:  $-0.71$  to  $-0.2$ ,  $p = 0.0023$ ), and waist circumference (MD:  $-0.99$  cm, 95% CI:  $-1.61$  to  $-0.37$ ,  $p = 0.003$ ) following ITF supplementation. For body fat percentage, a significant effect was observed following subgroup analysis on an intervention that lasted for more than 8 weeks (MD:  $-0.78$  percent, 95% CI:  $-1.17$  to  $-0.39$ ,  $p < 0.01$ ). The present meta-analysis of randomized controlled trials provides further evidence to support that ITF supplementation could help benefit weight management by reducing body weight, BMI, fat mass, waist circumference, and to a certain extent on body fat percentage.

**Keywords:** inulin-type fructans; weight management; meta-analysis; systematic review

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**Data Availability Statement:** The review was conducted using already published data.

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