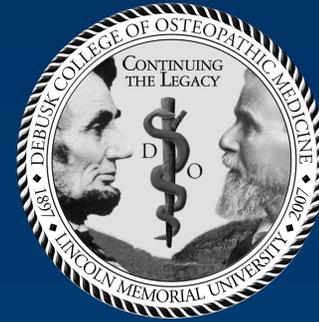


# Effects of Green Tea Consumption on Body Weight and Markers of Insulin Resistance: A Meta-Analysis



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## Objective

- To perform a meta-analysis testing the hypothesis that consuming Green Tea (GT) or Green Tea Extract (GTE) for over 4 weeks could lead to a reduction in body weight and insulin resistance in human subjects.

## Introduction

- Obesity and diabetes mellitus are leading causes of many conditions such as cardiovascular diseases and vision problems, especially in rural Appalachia.
- Green tea (*Camellia sinensis*) contains the catechin (-)-epigallocatechin-3-gallate (EGCG), which increases fat metabolism and energy expenditure, and could contribute to weight loss<sup>1</sup> (Fig. 1).
- Osteopathic physicians consider aspects of lifestyle that impact disease risk. Our results provide an updated guidance on dietary recommendations and offer insight into effect size translatable to the general population.



Fig. 1 *Camellia sinensis* with its active constituent, EGCG

## Methods

- A literature search for parallel-design, randomized, double-blind, controlled trials published in English and between 2010-2020 was done across 5 databases using the PICO approach (Fig. 2):
  - P = non-pregnant adults
  - I = consumption of green tea (GT) or green tea extract (GTE) supplement  $\geq$  4 weeks
  - C = GT/GTE versus control
  - O = change in body weight (kg) and/or Homeostatic Model Assessment for Insulin Resistance (HOMA-IR Index)

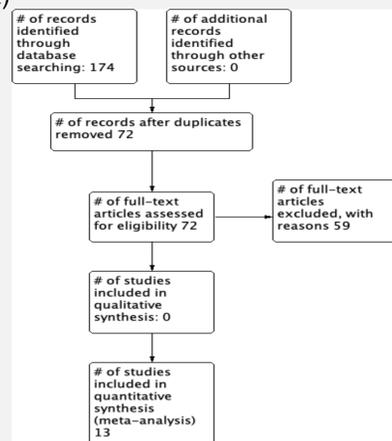


Fig. 2 – PRISMA study flow

- Three authors independently used the Cochrane tool for assessing risk of bias in the RCTs used in this study<sup>2</sup> (Fig. 3).
- Statistical analyses were performed using the REVMAN 5 software<sup>3</sup>.

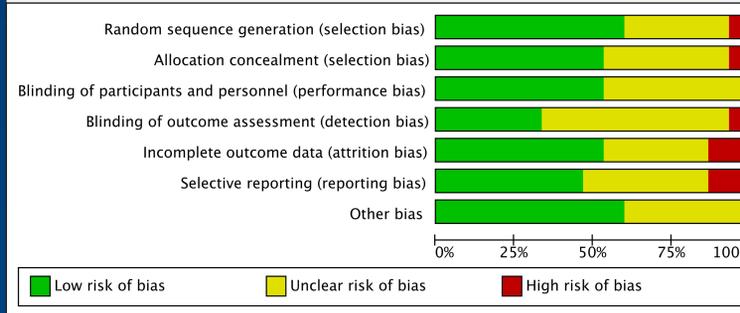


Fig. 3 Risk of bias assessment summary

## Results

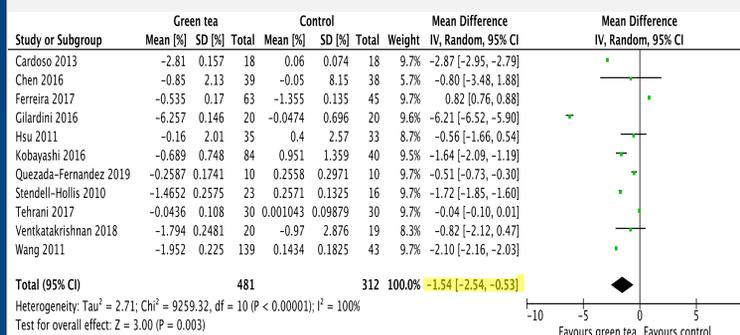


Fig. 4 Forest plot on % change in body weight (mean effect size = -1.54%, 95% CI = -2.54%, -0.53%, p=0.003)

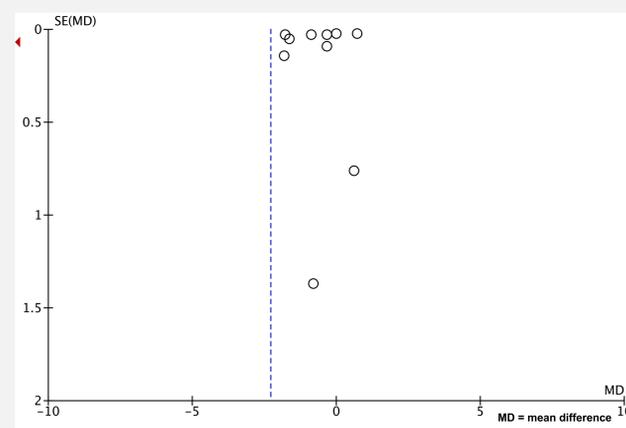


Fig. 5 Funnel plot on % change in body weight

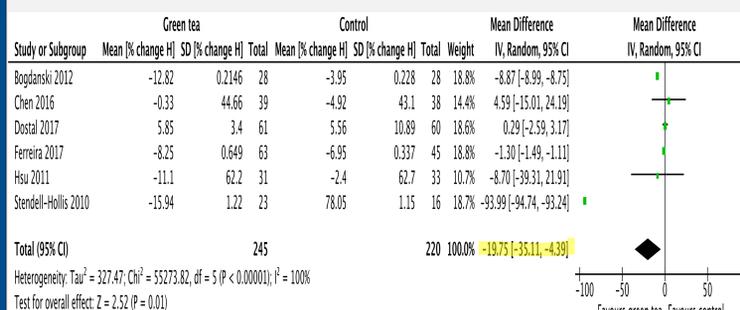


Fig. 6 Forest plot on % change in HOMA-IR Index (mean effect size = -19.75%, 95% CI = -35.11%, -4.39%, p=0.01)

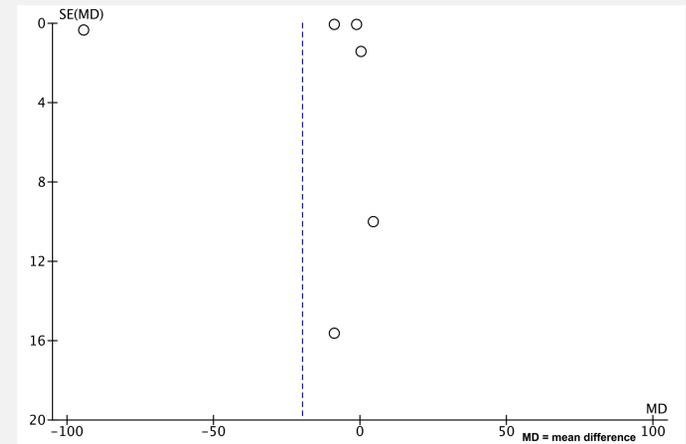


Fig. 7 Funnel plot on % change in HOMA-IR Index

## Discussion

- 13 studies were included in the meta-analysis. Consumption of GT or GTE for over 4 weeks led to a statistically significant reduction in % change in body weight and % change in HOMA-IR Index (Fig. 4 and 6).
- Possible publication bias because study methodology varied in patient selection, dosing, dosing strategy, and outcome measurements<sup>4</sup> (Fig. 5 and 7). However, the differences in patient population, dose and dosing strategy suggest a broader applicability of the results.
- Limitations of studies include lack of detailed documentation about participants' demographics. Biological sex, ethnicity, and pre-existing conditions could have an impact due to genetic polymorphism.

## Conclusion

- Drinking green tea may offer an accessible, inexpensive and well-tolerated tool to promote patient wellness through its impact on body weight and insulin sensitivity.
- Future studies could include large RCTs to investigate additional health benefits of green tea, such as anti-inflammatory markers.

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