**A Randomised Controlled Trial Assessing the Effect of the Mediterranean Diet Vs** **Australian Guide for Healthy Eating (AGHE) on Body Composition and Glucose Metabolism**

**Abstract**

**Aims:** The rising prevalence of obesity and metabolic disorders, such as type 2 diabetes, highlights the need for effective dietary strategies to improve health outcomes. The Mediterranean diet has been extensively studied and shown to reduce chronic disease risk. The Australian Guide to Healthy Eating (AGHE) offers a balanced dietary framework tailored to Australian habits, yet its comparative efficacy with the Mediterranean diet remains unexplored. Thus, this study aims to compare the efficacy of the Mediterranean diet with AGHE on body composition and glucose metabolism.

**Methods**: We conducted a randomised controlled trial including 57 participants (median age 31, IQR: 25-37 years; 71.9% female, BMI = 25.1 kg/m2), with 23 participants randomised to the Mediterranean diet and 34 participants to the AGHE diet for eight weeks. Anthropometric measurements (height, weight and waist circumference), resting metabolic rate (indirect calorimetry) and body composition (Dual-Energy X-ray Absorptiometry, DEXA) were assessed. Fasting serum samples were collected to measure glucose and insulin concentrations. Paired t-tests were employed for within-group comparisons, and analysis of covariance (ANOVA) was used for between-group comparisons, adjusted for age and baseline observations. Trial registration: ACTRN12619000178145.

**Results**: The Mediterranean diet intervention resulted in a significant decrease in waist circumference (-1.3 cm, p = 0.043), body fat percentage (-1.8%, p = 0.014), resting metabolic rate (RMR) (-17.9 kcal/day, p = 0.02), and fasting insulin concentration (-1.2 μIU/mL, p = 0.016), along with an increase in body lean mass percentage (1.7%, p = 0.015) compared to AGHE group.

**Conclusion**: The Mediterranean diet demonstrated greater efficacy in improving body composition and maintaining metabolic variables compared to the AGHE. These findings may support the use of the Mediterranean diet in improving health outcomes related to obesity and metabolic disorders. However, larger, well-designed clinical trials are needed to confirm these findings and explore underlying mechanisms.