

# Effect of vegetarian diets on the presentation of metabolic syndrome or its components: A systematic review and meta-analysis

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## Abstract

**Background & aims:** Several studies have examined the effect of vegetarian diets (VD) on metabolic syndrome (MetS) or its components, but findings have been inconsistent. The aim of this study was to perform a systematic review and meta-analysis of randomized controlled trials (RCTs) and observational studies to assess the association between VD and MetS or its components (systolic blood pressure [SBP], diastolic blood pressure [DBP], fasting glucose triglycerides, waist circumference [WC], HDL-cholesterol (HDL-C)) in adults. **Methods:** The Cochrane Library, EMBASE, PubMed, Web of Science, and Scopus were searched. RCTs, cohort studies and cross-sectional studies evaluating the effects of VD on MetS or its components in adults, with omnivore diet as control group, were included. Random effects meta-analyses stratified by study design were employed to calculate pooled estimates. **Results:** A total of 71 studies (n = 103 008) met the inclusion criteria (6 RCTs, 2 cohorts, 63 cross-sectional). VD were not associated with MetS in comparison to omnivorous diet (OR 0.96, 95% CI 0.50–1.85, p = 0.9) according to meta-analysis of five cross-sectional studies. Likewise, meta-analysis of RCTs and cohort studies indicated that consumption of VD were not associated with MetS components. Meta-analysis of cross-sectional studies demonstrated that VD were significantly associated with lower levels of SBP (mean difference [MD] −4.18 mmHg, 95%CI −5.57 to −2.80, p < 0.00001), DBP (MD −3.03 mmHg, 95% CI −4.93 to −1.13, p = 0.002), fasting glucose (MD −0.26 mmol/L, 95% CI −0.35 to −0.17, p < 0.00001), WC (MD −1.63 cm, 95% CI −3.13 to −0.13, p = 0.03), and HDL-C (MD −0.05 mmol/L, 95% CI −0.07 to −0.03, p < 0.0001) in comparison to omnivorous diet. Heterogeneity of effects among cross-sectional studies was high. About, one-half of the included studies had high risk of bias. **Conclusions:** VD in

comparison with omnivorous diet is not associated with a lower risk of MetS based on results of meta-analysis of cross-sectional studies. The association between VD and lower levels of SBP, DBP, HDL-C, and fasting glucose is uncertain due to high heterogeneity across the cross-sectional studies. Larger and controlled studies are needed to evaluate the association between VD and MetS and its components. © 2018 Elsevier Ltd and European Society for Clinical Nutrition and Metabolism

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## Author keywords

Blood lipids Blood pressure Glucose Metabolic syndrome Vegetarian diets Waist circumference

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