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REVIEW

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Effects of *Nigella sativa* on glycemic control, lipid profiles, and biomarkers of inflammatory and oxidative stress: A systematic review and meta-analysis of randomized controlled clinical trials

Jamal Hallajzadeh[1] | Alireza Milajerdi[2,3] | Moein Mobini[4] | Elaheh Amirani[5] | Susan Azizi[6] | Elhameh Nikkhah[7] | Babak Bahadori[7] | Razieh Sheikhsoleimani[8] | Seyyed Mehdi Mirhashemi[9]

[1]Department of Biochemistry and Nutrition, Research Center for Evidence-Based Health Management, Maragheh University of Medical Sciences, Maragheh, Iran

[2]Students' Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran

[3]Department of Community Nutrition, School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences, Tehran, Iran

[4]Faculty of Kinesiology, University of Calgary, Calgary, Alberta, Canada

[5]Research Center for Biochemistry and Nutrition in Metabolic Diseases, Kashan University of Medical Sciences, Kashan, Iran

[6]Student Research Committe, Maragheh University of Medical Sciences, Maragheh, Iran

[7]Medicinal Plants Research Center, Maragheh University of Medical Sciences, Maragheh, Iran

[8]Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran

[9]Metabolic Diseases Research Center, Research Institute for Prevention of Non-Communicable Diseases, Qazvin University of Medical Sciences, Qazvin, Iran

Correspondence
Seyyed Mehdi Mirhashemi, Metabolic Diseases Research Center, Research Institute for Prevention of Non-Communicable Diseases, Qazvin University of Medical Sciences, Qazvin, Iran.
Email: mirhashemismm@gmail.com

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The aim of this systematic review and meta-analysis was to evaluate the effects of *Nigella sativa* (*N. sativa*) on glycemic control, lipid profiles, and biomarkers of inflammatory and oxidative stress. Two independent authors systematically examined online databases consisting of, EMBASE, Scopus, PubMed, Cochrane Library, and Web of Science from inception until October 30, 2019. Cochrane Collaboration risk of bias tool was applied to assess the methodological quality of the studied trials. The heterogeneity among the included studies were assessed using the Cochrane's *Q* test and *I*-square (I^2) statistic. Data were pooled using a random-effects model and weighted mean difference (WMD) was considered as the overall effect size. A total of 50 trials were included in this meta-analysis. We found a significant reduction in total cholesterol (WMD: −16.80; 95% CI: −21.04, −12.55), triglycerides (WMD: −15.73; 95% CI: −20.77, −10.69), LDL-cholesterol (WMD: −18.45; 95% CI: −22.44, −14.94) and VLDL-cholesterol (WMD: −3.72; 95% CI: −7.27, −0.18) following supplementation with *N. sativa*. In addition, there was significant reductive effect observed with *N. sativa* on fasting glucose (WMD: −15.18; 95% CI: −19.82, −10.55) and HbA1C levels (WMD: −0.45; 95% CI: −0.66, −0.23). Effects of *N. sativa* on CRP (WMD: −3.61; 95% CI: −9.23, 2.01), TNF-α (WMD: −1.18; 95% CI: −3.23, 0.86), TAC (WMD: 0.31; 95% CI: 0.00, 0.63), and MDA levels (WMD: −0.95; 95% CI: −2.18, 0.27) were insignificant. This meta-analysis demonstrated the beneficial effects of *N. sativa* on fasting glucose, HbA1c, triglycerides, total-, VLDL-, LDL-cholesterol levels.

KEYWORDS
HDL-cholesterol, insulin resistance, LDL-cholesterol, meta-analysis, *Nigella sativa*, oxidative stress

Abbreviations: CRP, C-reactive protein; FBS, fasting blood sugar; HbA1C, hemoglobin A1C; HDL, high-density lipoprotein; HOMA-IR, homeostatic model assessment for insulin resistance; LDL, low-density lipoprotein; MDA, malondialdehyde; TAC, total antioxidant capacity; TC, total cholesterol; TG, triglyceride; TNF-α, tumor necrosis factor-α; VLDL, very low-density lipoprotein.

