



Association between diet, depression, anxiety and metabolic syndrome: a systematic literature review and meta-analysis

T. Paris¹, R.M. Daly¹, M.C. Ryan², S. Sood¹, C. Freer¹ and E.S. George¹

¹*Institute for Physical Activity and Nutrition, Deakin University, Geelong, Vic. 3220, Australia and*

²*Gastroenterology and Hepatology, St Vincent's Hospital, Melbourne, Vic. 3065, Australia*

The risk of depression and anxiety is higher in people with metabolic syndrome (MetS).⁽¹⁾ Dietary approaches have been shown to prevent and manage depression and anxiety.⁽²⁾ While dietary approaches are central to the management of MetS,⁽³⁾ their effect on depression and anxiety in people with MetS is uncertain. The aim of this systematic review and meta-analyses was to evaluate the effects of dietary interventions on depression and anxiety in adults with MetS or its components. Four databases (MEDLINE, PsychINFO, ENBASE and CINAHL) were searched from inception to June 2021 for dietary randomised controlled trials (RCTs) in adults with MetS or its components reporting changes in depression and/or anxiety scores. Estimates were pooled using random effect meta-analysis for dietary interventions compared with control groups. Fourteen RCTs were included in the literature review with 11 included in the meta-analyses. Overall, all dietary interventions (isocaloric and hypocaloric) and hypocaloric diets alone were associated with improvements in depression scores [pooled estimate for the mean difference: -0.17 (95% CI $[-0.33, 0.00]$, $p = 0.04$; -0.20 (95% CI $[-0.37, -0.03]$, $p = 0.02$, respectively]. However, subgroup analysis showed in seven studies there was no significant effect of all dietary interventions (isocaloric and hypocaloric) on depression scores in participants who were overweight/obese, although there was a significant effect in five studies that assessed hypocaloric diets alone in this cohort (-0.23 , 95% CI $[-0.40, -0.06]$, $p = 0.008$). There was no significant effect of all dietary interventions (isocaloric and hypocaloric) or hypocaloric diets alone on anxiety scores, including in those who were overweight/obese. In adults with MetS, dietary interventions were associated with improvements in depression, but not anxiety, but in overweight/obese individuals only hypocaloric diets were associated with improvements in depression. These findings suggest diet therapy may improve depression in MetS and may provide an adjunct to medical management.

References

1. Moradi Y, Albatineh AN, Mahmoodi H, *et al.* (2021) *Clin Diabetes Endocrinol* 7, 4.
2. Firth J, Marx W, Dash S, *et al.* (2019) *Psychosom Med* 81, 265–280.
3. Castro-Barquero S, Ruiz-León AM, Sierra-Pérez M, *et al.* (2020) *Nutrients* 12, 2983.