Proceedings of the Nutrition Society (2024), **83 (OCE4)**, E277 doi:10.1017/S0029665124005159

Nutrition Society Congress 2024, 2–5 July 2024

Effect of specific nutrients or dietary patterns on mental health outcomes in adults; A systematic review and meta-analyses of nutrition interventions

L. Montgomery[1], H. McNulty[1], M. Ward[1], L. Hoey[1], C. Patterson[2] and C. F. Hughes[1]
[1]*Nutrition Innovation Centre for Food and Health, Ulster University, Northern Ireland*
[2]*Centre for Public Health, Queen's University Belfast, Northern Ireland*

Mental health disorders are the leading cause of ill-health and disability, with depression and anxiety being among the most prevalent[(1)]. There is a growing body of evidence to indicate that optimal nutrition can help to promote better mental health, while suboptimal dietary patterns or status of specific nutrients have been associated with a greater risk of depression and anxiety, but the evidence is conflicting[(2,3,4.5)]. Therefore, the aim was to conduct a systematic review with metaanalyses to investigate the effect of interventions with specific nutrients or dietary patterns on mental health outcomes in adults.

Searches were conducted using the electronic bibliographic databases: MEDLINE, EMBASE and PsycINFO. The inclusion criteria were randomised controlled trials or controlled dietary interventions; study duration ≥ 12 weeks; participants aged ≥ 18 years old; outcome measures of depression or anxiety. The meta-analysis was conducted using Cochrane Review Manager Software (RevMan), version 5.4. The Risk of Bias and Quality of Evidence were assessed utilising the Cochrane Risk of Bias 2 tool and the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) framework, respectively.

A total of 68 studies met the inclusion criteria: 5 investigated dietary patterns, while 63 were nutrient interventions, involving omega-3 (n = 22), vitamin D (n = 18), B-vitamins (n = 10), zinc (n = 7), iron (n = 1), vitamin D combined with calcium (n = 4), and omega-3 combined with vitamin D (n = 1). Insufficient studies were available to conduct a meta-analysis for any nutrient in relation to anxiety; all results relate to depression. Meta-analysis results showed that zinc intervention significantly reduced depression (standardised mean difference (SMD) in depression scores was −0.67; 95% Confidence Interval (95% CI) −0.96, −0.37); 4 studies, GRADE: moderate certainty). No significant effects on depression were reported in response to intervention with omega-3 fatty acids [SMD 0.26 (95% CI −0.64, 0.12); 10 studies, GRADE: moderate certainty] or vitamin D [SMD 0.07 (95% CI 0.34, 0.47); 10 studies, GRADE: moderate certainty], while there were insufficient studies to perform a meta-analysis for B-vitamins and depression. There was also no significant effect of the Mediterranean Diet on depression [SMD −0.95 (95% CI -1.90, 0.01); 3 studies, GRADE: high certainty], and insufficient studies for analysis of the Dietary Approaches to Stop Hypertension (DASH) diet.

The results indicate that zinc supplementation has beneficial effects on depression, but there were no significant effects of intervention with the Mediterranean Diet, omega-3 fatty acids or vitamin D. These meta-analyses are however based on a limited number of intervention studies and therefore no firm conclusions can be reached. Further intervention trials are required to fully investigate the effects of specific nutritional factors on mental health.

Acknowledgments
This work was undertaken as part of a PhD scholarship funded by the Department for the Economy (DfE).

References

1. World Health Organisation (WHO) (2017) *Mental health of older adults*. [Available at: https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults].
2. Moore K, Hughes CF, Ward M *et al.* (2018) *Proc Nutr Soc* **77**(2), 152–163.
3. Markun S, Gravestock I, Jäger L *et al.* (2021) *Nutr* **13**(3), 923.
4. Lee DM, Tajar A, O'Neill TW *et al.* (2011) *J Psychol* **25**(1), 1320–1328.
5. Chan R, Chan D, Woo J *et al.* (2011) *J Affect Disord* **130**(1-2), 251–259.