



Is higher fruit and vegetable intake associated with a reduced risk of depression in middle-aged and older adults? Data from 10 diverse international cohorts

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Depression is the largest global contributor to non-fatal disease burden⁽¹⁾. A growing body of evidence suggests that dietary behaviours, such as higher fruit and vegetable intake, may be protective against the risk of depression⁽²⁾. However, this evidence is primarily from high-income countries, despite over 80% of the burden of depression being experienced in low- and middle-income countries⁽¹⁾. There are also limited studies to date focusing on older adults. The aim of this study was to prospectively examine the associations between baseline fruit and vegetable intake and incidence of depression in adults aged 45-years and older from 10 cohorts across six continents, including four cohorts from low and middle-income countries. The association between baseline fruit and vegetable intake and incident depression over a 3–6-year follow-up period was examined using Cox proportional hazard regression after controlling for a range of potential confounders. Participants were 7771 community-based adults aged 45+ years from 10 diverse cohorts. All cohorts were members of the Cohort Studies of Memory in an International Consortium collaboration⁽³⁾. Fruit intake (excluding juice) and vegetable intake was collected using either a comprehensive food frequency questionnaire, short food questionnaire or diet history. Depressive symptoms were assessed using validated depression measures, and depression was defined as a score greater than or equal to a validated cut-off. Prior to analysis all data were harmonised. Analysis was performed by cohort and then cohort results were combined using meta-analysis. Subgroup analysis was performed by sex, age (45 – 64 versus 65+ years) and income level of country (high income countries versus low- and middle-income countries). There were 1537 incident cases of depression over 32,420 person-years of follow-up. Mean daily intakes of fruit were 1.7 ± 1.5 serves and vegetables 1.9 ± 1.4 serves. We found no association between fruit and vegetable intakes and risk of incident depression in any of the analyses, and this was consistent across the subgroup analyses. The low intake of fruit and vegetables of participants, diverse measures used across the different cohorts, and modest sample size of our study compared with prior studies in the literature, may have prevented an association being detected. Further investigation using standardised measures in larger cohorts of older adults from low- to middle-income countries is needed. Future research should consider the potential relationship between different types of fruits and vegetables and depression.



Keywords: fruit; vegetables; depression; older adults

Ethics Declaration

Yes

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References

1. World Health Organisation. *Depression and other common mental disorders: global health estimates*. 2017.
2. Lassale C, Batty GD, Baghdadli A *et al.* (2019) *Mol Psychiatry* **24**(7):965–86.
3. Sachdev PS, Lipnicki DM, Kochan NA *et al.* (2013) *BMC Neurol* **13**:165.