



Mental health benefits of participating in gardening, consumption of fruits and vegetables among family caregivers of people with dementia in rural Southwestern Uganda

MAIN FINDINGS

- Participating in gardening activity and consumption of fruits and vegetables are associated with lower symptoms of depression and anxiety.¹
- Severe to extremely severe symptoms of depression, anxiety and stress were less prevalent among those who were involved in gardening compared with those who were not.¹
- Regression models predicted statistically significant associations between participation in gardening, consumption of fruits, vegetables and symptoms of depression, anxiety and stress.¹

RATIONALE

It is clear in literature accruing from research in high income countries that participating in gardening and the consumption of fruits and vegetables prevent mental health symptoms of depression, anxiety and stress in both adults and children.^{2,3,4,5} However, this intervention is less well recognized by mental health practitioners, researchers and policy makers from low- and middle-income countries. Our study aimed to estimate:

- (a) The association between fruit and vegetable intake and;
- (b) The association between participating in gardening activity and symptoms of depression and anxiety in a sample of family caregivers of people with dementia in southwestern Uganda.

METHODS

A cross-sectional study was conducted among 242 family caregivers of people with dementia in southwestern Uganda. Caregivers were assessed on their fruit and vegetable intake with a food frequency questionnaire. Following prior work⁴, we elicited gardening activity by asking caregivers whether they physically participate in gardening using their hands.

The Depression, Anxiety and Stress Scales (DASS-42) were used to assess caregivers' mental health problems.⁶ These subscales each contain 14 items, each of which is scored on a 4-point Likert-type scale ("never", "sometimes", "often", "almost always"), yielding a total score ranging from 0 to 42. Higher DASS scores indicate more severe symptoms of depression, anxiety, and/or stress.

Findings were adjusted for caregiving burden that was measured by the Zarit Burden Interview (ZBI).⁷ The 22-item scale measures different aspects of caregiving burden, each of which is scored on a 5-point Likert scale that ranges

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from “never” to “nearly always,” yielding a total sum score that ranges between 0 and 88.

Patient functional status was assessed using the Bristol Activities of Daily Living Scale (BADLS).⁸ BADLS total scores range from 0 to 60, with higher scores indicating more severe functional impairments⁹. Additional covariates included age and sex of the caregivers and their patients, the caregivers’ relationships with their patients, educational attainment (in years), and total duration of caregiving (in years). Using Stata software (version 16, Stata Corp., College Station, Tex.), we computed standard statistics to summarize characteristics of the sample.

The association between participating in gardening activity, fruit and vegetable consumption and mental health outcomes (depression and anxiety subscale scores specified as continuous variables) was estimated using multivariable linear regression models. To assess the robustness of our findings to potential confounding by unobserved variables, we conducted an e-value analysis.¹⁰ The e-value estimates the minimum strength of association, on the risk ratio scale, that an unobserved confounder would need to have with both the exposure and the outcome in order to completely explain away the estimated association. A large e-value suggests that an unobserved variable would need to pose very strong confounding in order to invalidate the findings.

NEXT STEPS FOR THIS RESEARCH

- This research provides evidence that gardening interventions which are culturally acceptable in this at-risk population and other settings may ameliorate symptoms of depression, anxiety, and stress.
- Further longitudinal studies will examine interactions between consumption of different categories of fruit and vegetable, and mental health problems.
- Funding proposals are being submitted to investigate the impact of participating in gardening activity on mental health problems among the female refugees in Uganda. Collaboration with food and agricultural institutions, psychiatry clinics in hospitals and medical schools will inform this research.

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